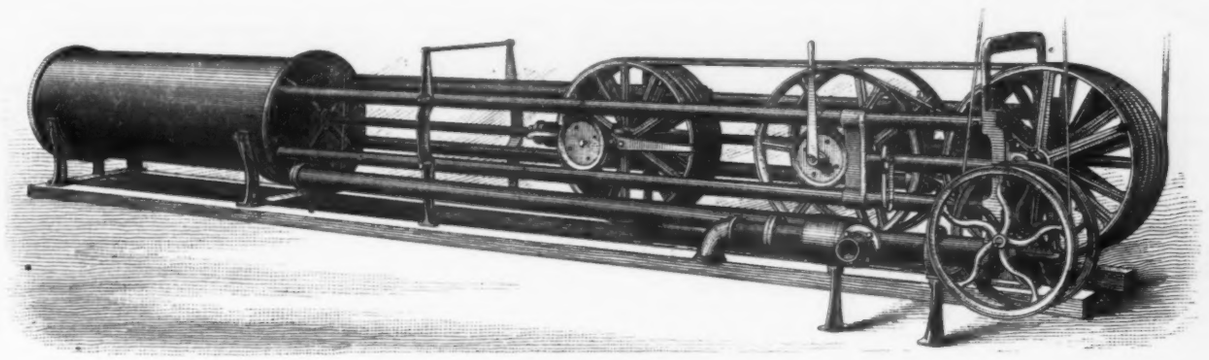
THE IRON AGE

THURSDAY, OCTOBER 30, 1890.

Variable Lift Hydraulic Elevator.

It will be observed in the accompanying engraving of this elevator that in "the pulling" all the strains on the piston rod are tensile. One end of the cylinder is left open, thereby affording easy means of lubrication and of adjusting the packing of the piston head without disengaging the sheaves or cables. The variable feature of the machine is obtained through means of the lever, which, by its action, engages or disengages part of the sheaves, thereby changing the number of sheaves called into operation, which, of course, increases or decreases the length of piston stroke required to raise the platform a given distance. As the amount of water consumed is in direct proportion to the length of the piston stroke, the saving is effected by using the shorter stroke, and, as the average service of elevators is with comparatively light loads, this feature becomes a decided economy in the expense of operating. The cylinder is made in one section, of heavy cast iron of strength sufficient to withstand a pressure of 200 pounds per square inch, and is bored true and smooth to give an even bearing for the piston. The fixed and traveling sheaves are 36 inches in diameter, of cast iron, with steel shafts, with variable appliances, carried on heavy wrought iron ways bolted to cylinder head and supported by iron legs. These machines are in use in many of the large business houses in the Central and Western States. They are made by the James L. Haven Company, Cincinnati, Ohio.



VARIABLE LIFT HYDRAULIC ELEVATOR.

Pennsylvania leads the sisterhood of States in the census of 1890 in the very important matter of increase in population for the decade since the last previous enumeration. The gain of the Keystone State, one of our Western contemporaries remarks, is no less than 965,683, making its total population last June 5,248,574. The growth is about 70,000 in excess of New York's increase for the ten years, and Pennsylvania is now only about 733,000 below the Empire State, and ahead of New York's population in 1880. This magnificent growth is almost wholly due to the great prosperity of a multitude of small manufacturing cities, and it is a most striking proof of the value of factories and mines as elements of a State's greatness. The large cities in which the commercial interests of Pennsylvania are chiefly centered did not gain very remarkably. The increase in the population of Philadelphia, Pittsburgh and Allegheny combined was less than 325,000, or only about one-half of the gain in New York, Brooklyn and Buffalo. But nearly every little center of productive industry in the Keystone State increased rapidly in population, and the result is seen in the magnificent total for Pennsylvania as a whole.

A New Iron Region.

The announcement has gone forth that the Richmond Terminal Railroad Company is back of a project to give the city of Norfolk, Va., a through trunk line to Cincinnati, Ohio.

This statement comes from company officials and may be relied on as trustworthy intelligence. The line will start from Norfolk over a road recently completed to Tarbon, in North Carolina, and extended to Stanhope, in Nash County, of that State. Thence it will go to Raleigh, where it connects with the regular Richmond and Danville line to Wilkesboro, by way of Greensboro and Winston.

From Wilkesboro the road is in course of construction to Bristol, Tenn., where it will connect with the South Atlantic and Ohio Railroad, which is being pushed forward to Cincinnati.

The country from Wilkesboro to Bristol is a fine mineral region. It is untouched by railroads.

Their new road from Norfolk to Cincinnati will, after leaving Wilkes, a county rich in mineral, pass through portions of Ashe and Watanga counties before crossing the North Carolina line. Adjoining Watanga is Mitchell County, where a noted iron deposit exists. Here the famous Cranberry ore is found. A pure magnetic, it is massive and generally coarsely granular. The length of the known outcrop is about 1500 feet.

There are other magnetic ore beds in the same vicinity, but of less extent. Ore is said to occur along the face of the same. Iron Mountain is about 2 miles eastward, and there are several others at the distance of 6 to 10 miles in a southeast direction. Deposits of ore are also found in other parts of the county; one of these is a bed of magnetite, on the lower slope of Little River Mountain, at Flat Rock. The ore is quite like the Cranberry.

There are known to be some important ore deposits on the waters of the North Fork or New River; there are others near the town of Jefferson on Horse Creek and Helton Creek. About 6 miles from the outcrops last mentioned there are on the same stream still larger deposits of magnetic ore, which has been long used in the forges of the neighborhood. This ore is a cross grained and very pure magnetite, one of the beds of which, if I remember right, is 18 feet in thickness, while another is 9 feet.

Ashe County is also rich in copper mineral. The famous Ore Knob copper mines are situated about 14 miles from Jefferson. This tract contains about 200 acres. The deepest underground work is 135 feet, and the vein is from 20 to 40 inches in thickness. The Ore Knob is one of a group of mines in this locality, but none of the others have been explored with the exception of Rich Knob, 2 miles distant. Owing to litigation these mines were idle for many years, and if I do not err they are yet idle.

One more remarkable feature of this region soon to be probed by the new road is its water power. Ashe County is 3000 feet above sea level, is hilly and mountainous, and has numerous streams that give it the greatest water power of any other county in North Carolina.

With the iron in such quantities and of such quality, adjacent to ample supplies of limestone, and within easy reach by rail of at least two coal fields, this portion of country so soon to respond to the developing touch of a railroad will in the next few years blossom forth as an iron district.

This railroad will parallel the Norfolk and Western as far as Bristol, or rather the two lines will constitute an elongated ellipse with the bottom or southern side somewhat flatter than its opposite. As this road will place the Pocahontas coal fields more than 50 miles nearer Norfolk than by the Norfolk and Western, it will be likely to catch a good part of the traffic that now goes to enrich the last named road.

The Pennsylvania Steel Company have, it is said, definitely decided to embark in the steel shipbuilding business. At a meeting of their stockholders a few days ago steps were taken to issue new capital stock to an amount that will realize $3,000,000. Of this sum $2,000,000 will be devoted to equipping a ship yard at Sparrow Point, 20 miles below Baltimore, on Chesapeake Bay, that is expected to be equal to any in the word. The company already own an extensive iron plant at Philadelphia, which will turn out the steel plates used in the ship yard. The officers believe they can build ships at a profit, on account of their great facilities. The company can take iron ore, limestone and coal and make their own pig iron, convert the pig iron into steel, and hammer the steel into ship plates all within their present plant. The full plans for the yard are not completed.

THE NORTHERN EXCURSION.

Our report of the Northern excursion last week ended with the arrival of the party at Houghton, Mich., and their inspection of part of the copper field on the 17th inst. Resuming the thread of the narrative, the next point visited was the

Calumet and Hecla Mine.

The largest and most prominent mine in the Lake Superior district is the Calumet and Hecla. The workings extend for a distance of about 2½ miles on the outcrop of the lode and are divided into three adjacent districts, the Calumet, the Hecla and the South Hecla. The belt, which is a conglomerate, varies in thickness from 8 to 25 feet, averaging about 12. Its dip is 37½° to the northwest The mine is operated by 13 shafts, five in the Calumet portion, four in the Hecla and four in the South Hecla. The deepest portion of the mine is about 3750 feet below the surface, measured on the dip of the formation, or about 2280 feet below surface, measured vertically. All the rock from this belt is sent to the Calumet Stamp Mills, at Lake Linden, a distance of about five miles from the mine. At the close of 1888, the vertical shaft, at Red Jacket, was begun and is being sunk vertically at the rate of about 3 feet per day and is so situated that it will strike the Calumet lode 3325 feet below the surface.

The Calumet and Hecla plant is conceded to be the largest in the world, and it called forth the most enthusiastic expressions from the visitors. It is so extensive that the company prepared a pamphlet of 16 pages dealing with it exclusively. This pamphlet gives a diagram showing the location of the several shafts, engine houses, stamp mills, smelting works and auxiliary buildings, with a detailed description of the entire machinery employed. It would require a great deal of space to give even the leading features of the massive machinery in use. A very large part of it has been constructed after designs made by E. D. Leavitt, Jr., the accomplished engineer of the company. The machinery on the mine location alone requires no less than ten extensive buildings. The largest engine in the company's service is named the Superior. It has inverted compound cylinders, 40 and 70 inches in diameter by 6 feet stroke and is designed to develop at 60 revolutions per minute, with 135 pounds boiler pressure, 4700 indicated horse power. The total weight of the engine is 428 tons. The load until recently has consisted of six hoisting drums (four being still in use), each 20 feet 4½ inches in diameter by 8 feet 4 inches wide, and adapted to wind 4000 feet of 1¼-inch wire rope. The Superior also drives two sets of Rand air compressors. The larger set has cylinders 36 inches in diametor by 60 inches stroke and the smaller set has cylinders 32 x 48.

Other Mines Visited.

The remaining daylight of the 17th inst. was devoted to an inspection of the Tamarack mine, which was reached after a short run. The Tamarack Mining Company were organized in January, 1882, for the purpose of sinking a perpendicular shaft to cut the Calumet belt. This shaft (No. 1) was begun in February, 1882, and on June 20, 1885, the belt was struck at a depth of 2270 feet. The average amount sunk per month was about 81 feet, which showed an excellent result for sinking in hard rock. The size of this shaft is 19 feet by 7 feet inside of timbers, and being vertical the lode is reached by cross-cuts driven at proper intervals. No. 2 shaft was started about 730 feet north of No. 1 in March, 1886, and reached the Calumet lode at a depth of 2575 feet. Its depth is now 2945 feet. manufacturing department began operations in April, 1888. The rod mill has a capacity of 30 tons of ⅝-inch rod per day, Shafts Nos. 3 and 4 are located about a mile north, and are expected to cut the lode at a depth of about 4000 feet. The machinery used here was built by E. P. Allis & Co., of Milwaukee. The Tamarack mill is situated on Torch Lake, about 6 miles from the mine, and has a capacity for working 1200 tons of mineral per day.

Reception at Hancock.

The evening of the 17th was given up to a reception in a large hall in Hancock by the ladies of Houghton County. It was a most enjoyable occasion, the citizens vying with one another to make the excursionists thoroughly comfortable and happy. The invitations to this reception were characteristic of the district. They were printed on a sheet of polished copper, attached by a silk ribbon to a daintily printed programme on heavy cardboard.

Saturday's Excursions.

Saturday, the 18th inst., was devoted to a variety of short excursions, the party being divided into several sections for that purpose. The first section visited the Quincy and Franklin mines, and the Quincy, Osceola and Tamarack mills. The second section visited the Atlantic mill and mine. The third section was taken to Dollar Bay to inspect the Tamarack-Osceola Copper Mfg. Company's furnaces and rolling mills. The fourth section was treated to a steamboat ride through the canal and out on Lake Superior. In the afternoon most of the excursionists visited the mining school, where Hon. Jay A. Hubbell welcomed them, and Director Wadsworth made a concise statement of the special features and plans of the institution. Sir John Alleyne, Theodore Fry, M. P., Dr. Lunge, Oberlin Smith, and others, followed in addresses which were remarkably interesting and were highly appreciated by their auditors. The mining school was erected by the State of Michigan and supplied with an outfit equal, if not superior, to any other in the country. No tuition is charged, and the only expense the student incurs is for use of apparatus in the laboratories. The aim of the school is to give a thereotical and practical knowledge of mining and its allied subjects. This it is enabled to do through the length of its course, its well equipped laboratories, and its proximity to a great number of mines, mills and furnaces, which are always open for students' inspection. The class of 1891 contains 16 students, and 1892 has 11 students.

Further Copper Mining Information.

The principal copper mines of the district not previously described are as follows.

The Quincy mine became a producer in 1856 and for years held second place as a copper producer of this district, but since 1887 the Tamarack has exceeded it in production. The Quincy is at present the leading mine working on the amygdaloids. The copper in this lode is very irregular in distribution, but most of it is found in small irregular masses. About 40 per cent. of the product of this mine is "mass" and "barrel work."

Exploratory workings with the diamond drill is used very extensively and successfully in the mine. The Quincy Mill is located on Torch Lake, about 6 miles from the mine. It is the newest and one of the best mills in the district. The mill proper is a building 198 x 120 feet, and contains at present three head of Ball stamps, built by E. P. Allis & Co., of Milwaukee.

Adjoining the Quincy on the north and working on the same lode, are the Pewabic and Franklin mines. The former is now idle, owing to litigations. The rock from these mines is stamped at their respective mills on the shore of Portage Lake, opposite Houghton. They were the first to use the Ball stamps, which were introduced in 1860. At the Franklin Mine, the manager, Johnson Vivian, presented each member of the party with a miniature ingot, weighing 8 ounces, as a souvenir of the visit.

On the south side of Portage Lake the only mines now in operation are the Atlantic and the Huron. The Atlantic lode was formerly supposed to be identical with that of the Quincy, but the best of authorities now place it in a different portion of the formation. It is an amygdaloid belt and contrasts strongly with the Quincy in the regularity of the occurrence of its copper, it being the most uniform in yield of any of the amygdaloid belts. The Atlantic Mill 2½ miles from the mine, is situated on the south shore of Portage Lake. It is similar to others of the district, differing only in a few details made necessary by the proportion of finely divided mineral to be treated. The Huron, which lies 2 miles east of the Atlantic, is working on an amygdaloid which is quite irregular in its mineralization. Their mill is situated a short distance from the mine.

The Allouez mine is in the conglomerate belt, and equipment has recently been added to work more extensively than heretofore. The Central mine is working in a fissure vein in the south side of the mineral range, and has a vertical shaft 2800 feet deep. The Osceola mine, which is under the same management as the Tamarack, was first opened in 1873 on the Calumet conglomerate a short distance from the South Hecla, but on development was found to be poor, their best ground running into the Hecla property. Explorations were made further south and east on this property, which ultimately resulted in the discovery of the Kearsarge amygdaloid, which lode is now being worked by the company. The Osceola mill is situated on Torch Lake, a short distance from the Tamarack. The rock from the Kearsarge mine is also treated here.

The Centennial mine is an extension of the Calumet on the north. The earlier openings on this property indicated the belt to be rather poor, but recent explorations have resulted in the finding of a new shoot of copper ground which is likely to result in the making of a good mine. It is not yet producing.

Copper Manufacturing.

The product of all the mines in Portage Lake and Ontonagon districts, except that smelted at Lake Linden by the Calumet and Hecla and at Dollar Bay, is smelted by the Detroit and Lake Superior Copper Company, whose works are situated on Portage Lake, between Hancock and Ripley. They have now in operation 12 reverberatory furnaces, each capable of smelting 11 tons of copper every 24 hours; also four cupolas with a capacity of 30 to 40 tons in 12 hours. The reverberatories are so constructed that masses weighing from 5 to 10 tons may be introduced without trouble. One mass smelted weighed, when introduced into the furnace, 12,000 pounds.

The products of the Tamarack, Osceola and Kearsarge mines are smelted at the works of the Tamarack-Osceola Copper Mfg. Company. These works, which are situated at Dollar Bay, are divided into two departments. The smelting department is in charge of Frank Klepetko and the manufacturing department in charge of R. G. Collins. The smelting department began operations in May, 1889, and is at present running three and sometimes four 15-ton furnaces. There are four more of these copper furnaces now building. The slag is treated in a 36-inch cupola furnace of a capacity of 60 tons per 24 hours. The

which is drawn into wire on the premises. In connection with the wire mills is a tinning department. An electric welder has been added to the plant, which has a capacity for welding a 1-inch copper rod. The works are at present turning out extra long lengths of wire. They have produced in one length a piece of O wire weighing 4500 pounds, and varying in diameter only $\frac{1}{1000}$ inch. The maximum capacity of the manufacturing department is about 500 tons per month of wire. Plates and sheets are also rolled in these works.

Copper Statistics.

The following statistical statements are exceedingly interesting:

Copper Mines now Producing.

Mines.	Local superintendents.	Depth in feet.	Tons rock hoisted, 1889.	Tons refined copper, 1889.	Tons copper to date.	Per cent. copper per ton rock stamped.	Dividends to date.
Calumet and Hecla.	J. N. Wright...	3,750	807,918	24,334	301,538	3.01	33,350,000
Tamarack.....	John Daniell...	2,818	196,707	5,518	16,624	3.26	1,200,000
Quincy.....	S. B. Harris....	3,070	123,998	3,203	53,250	2.72	5,250,000
Osceola.....	John Daniell....	2,162	208,299	2,631	25,312	1.29	1,222,500
Franklin.....	Johnson Vivian	2,620	186,740	2,173	31,961	1.87	960,000
Atlantic.....	F. McM. Stanton	1,660	288,040	1,849	23,786	0.66	560,000
Huron.....	Johnson Vivian	1,800	159,333	1,109	10,652	0.98	.....
Kearsarge.....	John Daniell....	1,000	76,541	960	1,384	1.71	80,000
Allouez.....	Fred Smith....	1,700	126,125	881	11,427	0.76	.....
Central.....	Jas. Dunstan...	2,900	Mostly mass	635	20,355	.....	1,930,000
Copper Falls.....	J. H. Moyle....	1,500	.....	435	10,789	0.70	100,000
Peninsula.....	Wm. A. Dunn..	600	.....	368	.....	.....	.....

Principal Stamp Mills.

Mills.	Superintendents.	Tons Rock stamped, 1889.	No. of steam stamps.	No. of jigs.	No. of slime tables.
Calumet and Hecla.....	F. G. Coggin.....	807,918	17	624	72
Tamarack.....	John Gundry.....	169,250	4	238	14
Quincy.....	Geo. Bedell.....	117,785	2	56	8
Kearsarge.....	John Gundry.....	56,104	4	148	6
Osceola.....		175,587			
Franklin.....	John Funke.....	141,579	4	32	4
Atlantic.....	Wm. J. Evans.....	278,680	5	92	15
Huron.....	Wm. J. Vivian.....	112,723	2	30	5
Allouez.....	Henry Hillegass.....	116,608	4	55	5

This is a marvelous record for a single district. The dividends paid will attract much attention very naturally. The Atlantic mine is exceptionally notable, as it is a good dividend payer, although working the leanest rock. Its management is certainly superb.

Sunday was observed at Houghton mainly as a day of rest and recuperation from the fatigues of journeying and sight seeing. A steamboat ride through the canal to Lake Superior was enjoyed by a large party in the afternoon. In the evening the excursionists took their leave of the copper country and its hospitable citizens and proceeded to the Marquette iron ore district.

In the Marquette District.

Early on Monday morning, 20th inst., the visitors arrived at Michigamme, where they were welcomed by a delegation of the leading citizens of the Marquette range, headed by mayors Longyear, of Marquette; Anthony, of Negaunee, and Hill, Ishpeming. Time cards were issued, giving the names of mines to be visited and the time to be spent at each. The citizens of Marquette presented every person in the party with a souvenir, consisting of a plate of polished Bessemer steel, made from Lake Superior ore, having a suitable inscription etched on one side. This souvenir was the work of Henry Disston & Son, of Philadelphia, and was well received. Badges were also distributed.

A cordial invitation was given to everybody to attend a reception at the Nelson House, Ishpeming, the same evening, and another reception at Peter White's residence, in Marquette, on the following evening. Inspired by excellent music from the English Oak Band of Negaunee, the party then proceeded to inspect the Michigamme mine. This is a deposit of hard magnetic ore, producing some 50,000 tons annually. The point of special interest attached to this mine is the use of magnetic separators for the purpose of making lean ore merchantable. Much of the ore is rich enough to ship in the natural condition, but a considerable part is not. The Venstrom separator is used. The character of the ore renders its separation by this method comparatively simple. Ore and jasper are banded, so that when crushed the flakes of rock and ore fall apart. The large masses are put through a Blake crusher, whence elevators carry the resulting product to pockets over the dynamo. The separator consists of a horizontal cylinder, to which the ore adheres until it is carried completely around and discharged into a chute, while the rock falls off when the vertical tangent is reached and passes into a separate chute. The ore is thus converted from a 48 per cent. ore to over 61 per cent. The percentage of phosphorus is also diminished, it being largely contained in the rock which is taken away. So successful has this process proved that the Michigamme mine will hereafter be a much larger producer, probably reaching 100,000 tons this season. The Champion mine was next visited, and its extensive equipment was inspected with many expressions of pleasure. Numerous samples of its fine ore found their way to the pockets of the visitors. The Republic was next on the programme, and, as everybody had heard of its fame as a producer, it was very thoroughly examined by the party. The large open pit was specially attractive to the geologists among the number, who critically examined the formation thus exposed. The Clift Shaft mine was the last visited on this day. Unfortunately but few miners were at work, most of them being on strike for shorter hours. The hoisting machinery was therefore not seen at its best, but the pumps were examined with interest, and few parts of the surface equipment escaped the notice of the vigilant English and German visitors. They made searching inquiries on the subject of the strike, and when they learned the rates paid for mining and the hours worked were surprised to think that any ground could be found for the demand made upon the mining companies about Ishpeming, where the strike cenetred.

The reception at the Nelson House was very greatly appreciated by the visitors. The prominent citizens of Ishpeming were present, as well as numerous others from adjoining towns, and the excursionists were given a most cordial welcome. The hotel was draped with evergreens, enlivened by the scarlet berries of the mountain ash, while conspicuous among the decorations appeared the flags of Great Britain, Germany and the United States suggestively intertwined. There was no formality about the gathering, but a most efficient committee looked after the comfort of the guests, and saw that none were suffering from lack of attention and introductions.

The night was spent at Ishpeming, and in the morning the visitors sallied forth to see the mines in the immediate vicinity, among which are some of the largest producers in the world. The inspection of these mines was assisted greatly by an illustrated special edition of *Iron Ore*, an Ishpeming paper, which gave the salient points regarding each mine, as well as statistics concerning the shipments of ore. The mines of the Ishpeming basin and the quantity of ore shipped by each from the opening of the mine are as follows:

Mine.	Gross tons.
Lake Superior.....	5,001,064
Cleveland.....	4,429,423
Lake Angeline.....	1,772,026
Iron Cliffs.....	1,270,919
New York.....	1,055,396
Winthrop.....	1,089,524
Saginaw.....	439,328
Salisbury.....	678,724
Detroit.....	134,712
Fitch.....	15,937
East New York.....	64,957
Total.....	15,947,070

The Lake Superior, Lake Angeline and Cleveland mines were visited by most of the excursionists, but special parties were taken to other points of interest in the vicinity, the Ropes gold Mine being an object of much interest to quite a number. The Ropes mill contains 65 heads of stamps and is in active operation. In the year ending February 28, 1890, the rock treated was 31,365 tons, with an average yield of $3.18 per ton. Those who visited the Lake shaft of the Cleveland Mine were invited to inspect a mill which has just been completed by the Cleveland Company, and which is provided with ingenious machinery for framing mine timbers. Huge pieces of timber, 20 inches in diameter, are mortised and tenoned so accurately that when they are taken into the mine they can be set in place without further trimming and form a rigid framework. The machinery was seen in motion, and its clever arrangement was universally admired. On leaving the Ishpeming basin the excursionists passed the Jackson Mine, which they could not overlook, in view of its historical connection with the Lake Superior iron ore district, it having been the first mine opened. A hurried but most interesting visit was paid to this mine, a large party walking in procession through the upper tunnels connecting the different workings. A stop was next made at Negaunee, where the Pioneer furnaces of the Iron Cliffs Company are located, manufacturing pig iron with charcoal fuel. As many of the

excursionists had never seen a charcoal furnace they were very much interested in its arrangement and equipment, and carefully observed all its details. During their stay they had the pleasure of seeing a cast. The Austrian members of the group, with their knowledge of the Styrian charcoal furnaces, were hardly less curious than the others, and noted the difference in details between an American and a Styrian charcoal furnace.

Marquette was reached early in the afternoon of the same day (21st). The local committee, under the management of Mayor Longyear, Richard A. Parker and others, had made ample preparations for the information and entertainment of their guests. Souvenirs were distributed in the shape of an illustrated card, showing a view of the ore docks and giving important points bearing on the city's business interests. A report by the Committee on Coke Iron Manufactures was also distributed. This committee was appointed to look into the question by the Citizens' Association. Their report is very favorable for the city of Marquette, tables being printed to show that coke pig iron can be manufactured for $13.50 per ton, against $12.17 at Chicago and $14.11 at Milwaukee. The report recommends the establishment of a home market for the consumption of any pig iron made, and suggests for that purpose a variety of works whose products would be immediately merchantable. Richard A. Parker signs the report as chairman of the committee. The visitors were first taken to the north ore dock to inspect the method of unloading ore cars and loading vessels. This dock has 200 pockets, each with a capacity of 140 tons of iron ore The dock is built high enough to enable the ore to be dumped through chutes at the bottom of the pockets directly into the holds of the vessels The ore docks at Marquette are four in number, contain in all 744 pockets, and have a total capacity of 70,900 tons of ore. The total length of the four docks is 4918½ feet. The ore shipped from them in the year 1889 amounted to 1,520,886 tons. The excursionists were met on their return from the dock by a large number of carriages and driven to Presque Isle, a beautiful promontory running out into Lake Superior, containing about 300 acres, and located some three miles from the center of the city. This is a park owned by Marquette and constituting one of the attractions of the vicinity. On the return the carriages stopped at the new Hawley sawmill, to enable the visitors to see the best methods now in use for the rapid conversion of logs into boards and other lumber. Large band saws are employed in ripping the logs. The carriages conveying the logs back and forth are directly attached to a steam piston, and the speed with which they travel back to prepare for a fresh cut is simply thrilling. The introduction of numerous labor-saving devices in handling lumber greatly interested the visitors, few of whom had previously known the perfection to which sawmill machinery and lumbermen's methods have advanced in this country. The statement that this mill turns out 200,000 feet of sawed lumber daily was received with credence after an inspection of the rapid system of manipulating the material. Much interest was taken in one of the workmen in the lumber yard, who was found to be an Indian, and he was closely inspected as a genuine curiosity. On returning to the city the discovery was made that venison and bear meat were to be had in the butcher shops, and several private dinner parties were arranged at which these tid-bits were to serve as the central dishes. In the evening carriages conveyed the excursionists from the cars to the residence of Peter White, where they were tendered a reception by the citizens of Marquette. The members of the party from abroad were particularly pleased with this arrangement, as it was the first time that many of them had been received in an American home, and they here had an opportunity of seeing how Americans lived. Mr. White received his numerous guests with overflowing cordiality, and made them feel thoroughly at home in his hospitable mansion. The citizens of Marquette were out in full force, and left nothing undone in their endeavors to administer to the comfort and pleasure of the excursionists, who in return found it difficult to express their satisfaction in sufficiently glowing terms. In the night the train left Marquette for Sault Ste. Marie, arriving there at 7 o'clock on the morning of the 22d. A deputation from the Chamber of Commerce welcomed the party to "the Soo," and had made preparations to show them the chief features of interest there, but only a short stay was made, barely long enough to enable them to see a large vessel passed through the canal lock on its way from Lake Superior to Lake Huron It was difficult to realize that through this inland passage between two fresh water lakes a greater tonnage yearly moved than through the Suez Canal. The construction of the new lock was a matter of considerable interest. It will be 800 feet long and will have a depth of 18 feet over the sills, and is making very rapid progress. No time was left in which to inspect the channel for the water-power to be utilized in building up manfacturing interests at Sault Ste. Marie. With a fall of 18 feet, however, and the water of Lake Superior to depend upon as the supply, it was readily seen what an enormous power could be developed at very low cost. At 9 o'clock the great bridge over the St. Mary's River was crossed, and the train passed into Canada, destined for the nickel mines of Sudbury, situated on the line of the Cadadian Pacific Railway. These mines were inspected and the excursionists then departed for Niagara Falls, where they spent a portion of the 24th inst. At the Clifton House, Niagara Falls, on the Canadian side, they were entertained at lunch by Erastus Wiman, with whom a local committee composed of the mayor and other prominent citizens co-operated for the reception of the visitors. At 5 o'clock the party left for Washington to rejoin the Southern section.

The Mechanical Engineers.

The next meeting of the American Society of Mechanical Engineers will be held at Richmond, Va., on November 11, 12, 13 and 14. The following is the programme:

Tuesday afternoon, November 11.—The opening session of the convention will begin by an address of welcome by his Honor the Mayor of Richmond, J. Taylor Ellyson, followed by the annual address of President Oberlin Smith of the society.

In the evening a reception will be tendered by his Excellency, the Governor of the State of Virginia, at the Philip McKinley Gubernatorial Mansion in Capital square.

The second session on Wednesday morning, November 12, will be a business session, including reports of tellers, general and new business and reports of the society's committees on Methods of Testing Materials, Methods of Duty Trials of Pumping Engines; Methods of Test of Locomotive Efficiencies, and on Uniformity of Flange Diameters.

After the introduction of any new business, the professional papers will be presented as follows:

"Light Cable Road Construction." Frank Van Vleck.
"Authorities on the Steam Jacket: Facts and Current Opinions." R. H. Thurston.
"Chimney Draft: Facts and Theories." R. H. Thurston.
"A Novel Form of Flexible Tubing." T. R. Almond.
"Heat Transmission Through Cast Iron Plates Pickled in Nitric Acid." R. C. Carpenter.

A boat will leave the Ariel Wharf at 1 p.m. for an excursion down the James River to visit the seven United States monitors; the historical Drewry's Bluff and Dutch Gap.

During the third session, Wednesday evening, the following professional papers will be read:

"Some Properties of Ammonia." De Volson Wood.
"Mechanical and Physical Properties of Sulphur Dioxide (SO_2)." De Volson Wood.
"Theoretical Investigation of Efficiency of Vapor Engines." De Volson Wood.
"Experimental Determination of the Latent Heat of Ammonia." D. S. Jacobus.
"Automatic Regulation of Injection Water to Vapor Condensers." Jas. McBride.

Topical discussions.

The fourth session, Thursday morning, November 12, will be taken by the professional papers as follows:

"Hydraulic Hoisting Plant for the Pier of Brooklyn Sugar Refining Company." Louis G. Engel.
"Hydraulic Traveling Cranes." Erwin Graves.
"The Single Acting Compound Engine." W. A. Bole.
"Rope Driving." C. W. Hunt.
"Accident Preventing Devices for Machines." Jno. H. Cooper.
"New Process for Generating and Cutting the Teeth of Spur Wheels." Ambrose Swasey.
"An Interesting Experiment with a Lubricant." Geo. W. Bissell.
"Performance of a 75-Ton Refrigerating Machine of Ammonia Compression Type." Jas. E. Denton.
"Some Novel Experiments with a Lubricant." Jas. E. Denton.

Topical discussions.

Carriages at the door of the Exchange Hotel will convey the members to the Tredegar Iron Works, where a luncheon given by the company will be served, and after an inspection of this historical place, the party will be driven to the Richmond Locomotive Works, cigarette and tobacco factories, the Lee Monument, the Water Works, Hollywood Cemetery and other points of interest.

On Thursday evening the society will be entertained by the citizens of Richmond.

On Friday morning, November 15, a special train, tendered by the Chesapeake and Ohio Railway Company, will leave the Chesapeake and Ohio Depot at 8.30 a.m. and convey the party to the yards of the Newport News Shipbuilding Company, who have extended an invitation to inspect their plant. From there the Atlantic and Danville Company will take the party by their boats to the Portsmouth Navy Yard, where the United States battle ship Texas and the cruisers will be inspected; then to Norfolk, where several interesting places will be visited.

The party will be landed at Old Point Comfort to return by the excursion train to Richmond, or by direct route to Philadelphia, or by steamer North, as they may select.

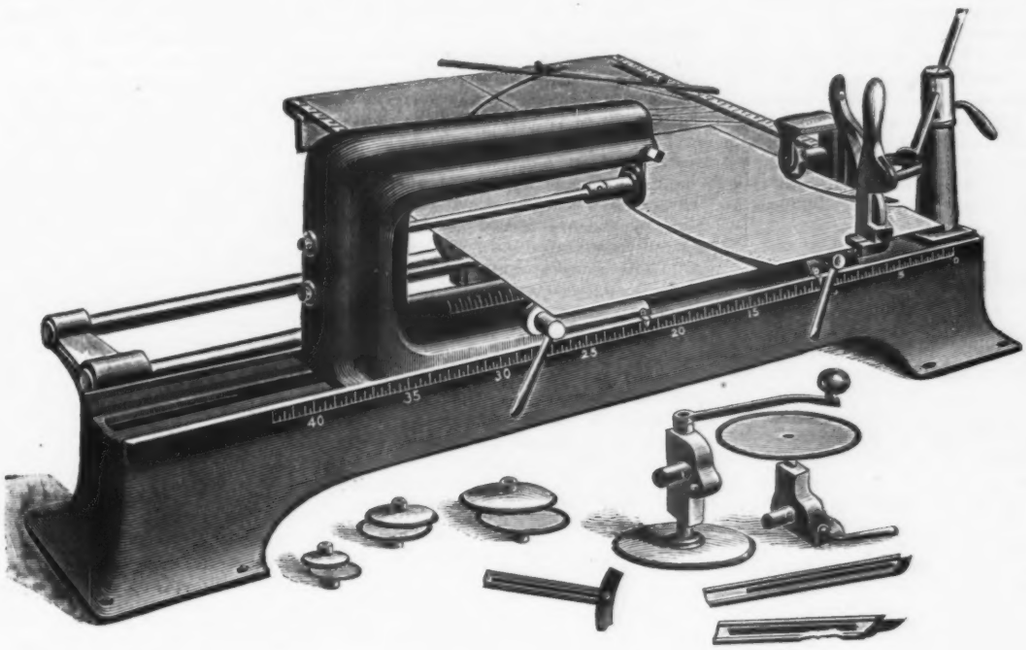
The Committee on Finance of the Senate has had prepared a comparison of the Customs law of 1883 with the new law of 1890, with an index and an appendix containing the Administration Customs law of 1890. This document has just been published.

It is flattering to Americans that the first locomotives in Palestine were made in the United States. They will run between Jerusalem and ancient Joppa.

Universal Sheet Metal Cutting Machine.

In the accompanying illustrations we show views of a machine designed for rapidly cutting tin and sheet metals without the use of special tools, dies or patterns, which is being manufactured by Greenlee Brothers & Co., Chicago, Ill. This machine is said to be the result of long years of careful study and experiment by a practical sheet metal worker, and the manufacturers feel that it is fully adapted to meet the exacting reqirements of the trade. It is said to be simple in construction, economical in operation, and is claimed to do more and better work in an hour than a skilled man marking out by pattern and cutting with stock shears can do in ten hours. It is provided with a chartered pattern table with all the necessary degrees and angles and directions how to set the different parts for cutting any article in the assortment line. The measures are all laid out United States Standard, and all articles, round or oval, are claimed to be cut to the best advantage. The manufacturers refer to the fact that all vessels cut with this machine require no trimming afterward, and that a side piece of any vessel may be cut in less time than it would take to mark it. In Fig. 1 of the accompanying illustrations the machine is shown set for cutting sides of flaring vessels. A clamp is furnished by the use of which strips for coffee pots from 1 inch upward may be cut very rapidly. It is also stated that elbows may be cut very rapidly, and that when put together they form perfect angles of any degree, no trimming or fitting being necessary. The circular cutters have concave surfaces and require no grinding or sharpening.

The machine has a heavy iron body, on top of which slide two head blocks, each carrying two circular cutters. These head blocks, the manufacturers state, may be readily moved and locked at any point, and their position indicated by pointers on the long scale. The cutters on the large head block are easily adjusted to any position on the shafts on which they travel, the diameter of the bottom they will cut being shown on the short scale directly underneath. The pattern table is supported and slides on a frame which holds it very firmly. This frame travels on two steel guides placed parallel with the body. The table swings on a pivot and can be quickly set and locked in any position. The sweep is said to be readily adjusted to any radius from 3 inches up, while the clamp on the end of the sweep is pivoted to the main horizontal arm, so that it may be readily adjusted to any



Greenlee's Sheet Metal Cutting Machine.—Fig. 1.—Machine Set for Cutting Sides of Flaring Vessels.

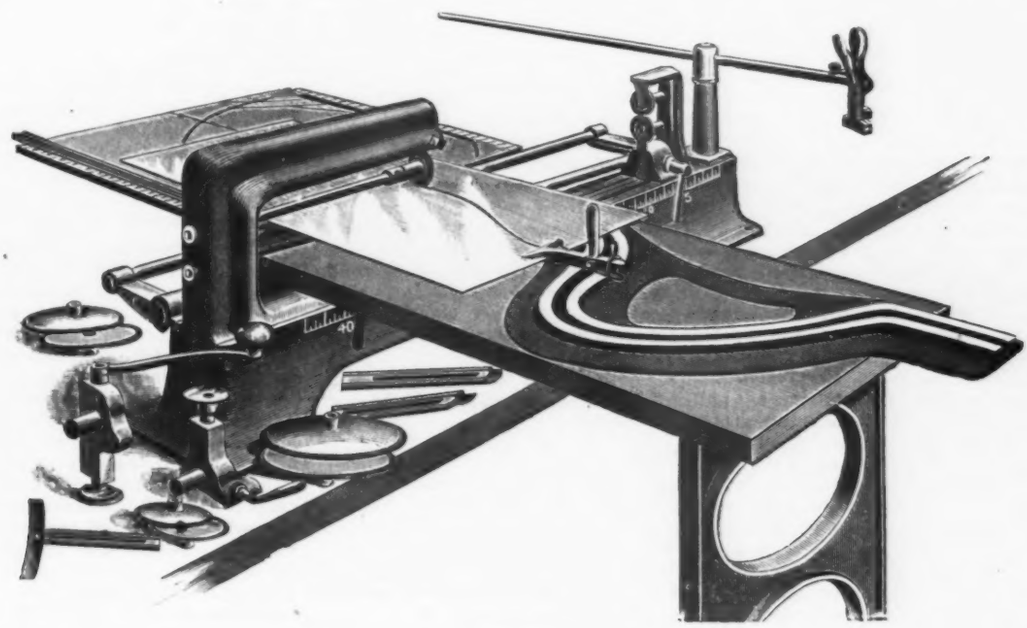


Fig. 2.—Complete Machine with Elbow Cutting Attachment.

angle desired. The machine may also be used for squaring tin or cutting it into strips. With the circular shears bottoms may be cut from 2 inches up to 2 feet in diameter. Four pair of disk clamps are furnished with the machine. It is said that one revolution of the crank cuts a bottom with the greatest ease and rapidity. In Fig 2 of the cuts, the machine is shown complete with elbow cutting attachment. The manufacturers state that the cutting may be very rapidly executed, and that no cutting or trimming is necessary when putting together. The elbow cutting attachment includes extension table with support and a large head block with one pair of cutters. Guides or forms for cutting elbows for pipe from 2 inches in diameter upward, and with three or more pieces, as may be preferred, can be furnished.

The Electrical Transmission of Power.

From a paper on the above subject read by Eugene Griffin before the Boston Society of Civil Engineers we take the following:

The feasibility of transmitting power over long distances by the aid of electricity, means many advantages when steam is the prime power. It enables us to locate the steam plant by the water side, where compound condensing engines can be used, and where by concentration of stations we can use large engines with the greatest economy in coal consumption. It enables us to save materially in our real estate investment. It enables us to locate near the railroad track or the wharf, where coal can be delivered direct, without cartage. It enables us to keep out of the heart of the city, where power stations may be objectionable, both on account of noise and smoke. But these advantages, great as they are, are nothing compared with the possibilities in the way of utilizing our water powers.

Electicity is specially adapted for use with such powers, and may be used in one of two ways. The dynamos driven by the water wheels may be connected by wires with the neighboring city mill or mine, where the power is to be utilized, or the electrical energy developed may be stored in batteries for distribution throughout the city. I do not regard it as at all improbable that some day the retail dealer make take our order for jars of electricity as he now takes it for quarts of milk. The storage battery needs much development before such a system of distribution is possible, and the conditions giving cheaper power and cheap transportation must be very favorable to make it economical. Moreover, it must always be restricted to small powers. For large powers the direct system will be used. If the distance be not too great, electrical energy may be developed at the desired voltage and so transmitted. If the distance be too great or the quantity to be transmitted too large, a low voltage would be out of the question on account of the cost of the immense mass of copper necessary to carry such quantity. In such case we should use a high voltage, 4000 or 5000, the proper voltage being a question for mathematical determination. As the horse-power is a function of the product of the voltage and the quantity, and the carrying capacity of the wire is measured by the quantity alone, it is manifest that by increasing the voltage we increase the horse-power, and so can transmit more energy over the same wire. With a given size wire capable of transmitting a given quantity of electricity with a given loss, we can by increasing the voltage only increase the power transmitted without changing any of the conditions. Therefore, a high voltage is desirable, necessary and economical when power is to be transported long distances. The high voltage is dangerous to life, is dangerous to the machine and is more difficult to insulate. These are the objections. A careful consideration of the relative advantages and disadvantages and a mathematical calculation on the cost of wire will enable us to determine the most economical conditions. When the interest on the investment in copper is just equal to the cost of generating the power wasted in transmission, the point of ultimate economy is attained.

The alternating current may be used for such transmission, as it admits of immemediate conversion to any desired potential by aid of the transformer. This current is, however, not suited to power work, and, in general, we must depend upon the direct current. Under the conditions supposed, we must establish a station in the city where the current transmitted from the original station is made to run large motors, which in turn drive arc and incandescent lighting machines, power dynamos, &c. The circuits from these machines are established as usual. Let us see what the loss would be in such a system. Assuming an efficiency of 80 per cent. in the wheel, an efficiency of 92 per cent. in the dynamo, a loss of 15 per cent. in the line and an efficiency of 90 per cent. in the motor, we have:

	Horse-power.
Total water power applied to wheel	100.0
Total power applied by wheel to dynamo.	80.0
Total output of dynamo	73.6
Total power applied to motor at city station	62.6
Total output of motor	56.3

This is assuming that we purchase water power or rate it on the basis of theoretical capacity. If we compare the wheel output with the steam engine output, we have the following:

	Horse-power.
Total power applied by wheel to dynamo.	100.0
Total output of dynamo	92.0
Total power applied to motor at city station	78.2
Total output of motor	66.5

The output of the motor is applied directly to the working dynamos, as would be the output of a steam plant at the station. It would appear, therefore, that the system of transmission and conversion entails a loss of power of 33.5 per cent. The interest on first cost of plant, the cost of maintenance and the cost of generating under the two systems will show which is the cheaper. Let us make a comparison.

If by going five miles away we can get water power, will this be cheaper than to furnish the power direct by steam, supposing 1000 horse-power be required?

Assuming the steam plant complete to cost $50 per horse-power, the investment will be $50,000. The cost of operation will be, for an economical plant, about $32 per horse-power per annum. From this we have the following:

Cost of steam plant	$50,000
Interest and depreciation on plant.	$7,000
Cost of operation	32,000
Total	$39,000

That the motor by the system of transmission may yield 1000 horse-power it is necessary that 1420.86 horse-power be applied to the dynamo by the wheel. Assuming that the cost of the water power plant complete is $50 per effective horse-power, we have:

Cost of water power plant	$71,043	
Cost of dynamo plant	33,000	
Cost of line	6,000	
Cost of motor plant	30,000	
Total cost		$140,043
Interest on investment	$8,402	
Depreciation	6,606	
Cost of operating water and dynamo plant and motor plant	16,000	
Total		$31,008

Even this shows economy over the steam engine. Should we combine both methods and let the water-power plant run all night to charge storage batteries, then we have an additional economy which may be of very great importance.

These figures are, of course, simply estimates. All that I desire to prove is that it is possible, by the aid of electricity, to utilize water powers located at considerable distances from the point where the power is to be used, even when such transmission entails a double conversion. The cost of water-power plants is as variable as the plants themselves, so that any estimate must of necessity be very general.

There is no limit to these general applications. Where large central power plants have been established, it is found that power can be sold considerably in excess of the station capacity, as so many of the motors are intermittent in their demands that we are never called upon to supply the full power contracted for. This means better profit on the investment and cheaper power to the consumer. It is probable that the electric motor will soon supersede the small portable engine now used in dock hoisting work, in building construction and in similar situations. The greater portability, economy, efficiency and safety make such substitution only a matter of time. For all local purposes where small powers are required the motor is not only more economical and safe, but it has another decided advantage—namely, cleanliness. The electric motor is a neat and even ornamental machine, and many users speak in quite as glowing terms of its advantages over steam in way of cleanliness as of its other points of superiority. Its use is spreading in all our cities, and the demand far exceeds the capacity of our factories.

As illustrating the advantage of separate motors on intermittent machines, such as are used in many mills and on all city power circuits, I quote the following from an account of the operations of an electrical installation in one mill:

"The power which would be required to operate our factory in the usual way, by belting through the floors, was estimated by several engineers, competent in factory construction, to be between 30 and 50 horse-power; without considering the power required for our lights, amounting to an additional 15 horse-power. In other words, we are delivering an estimated 50 to 70 horse-power and only developing 15 to 30 horse-power, with an average of but 17 to 18 horse-power for ten hours.

"When comes this apparent something for nothing? I will try and explain to you. Every operator in our factory who has charge of a machine, be it a milling machine or a drill press, a lathe or a planer, has a certain and absolute direct and instantaneous control over the automatic valve gear on our engine in the basement through the medium of his belt shifter. We will suppose he is using a milling machine; the piece being milled has finished its travel and the machine is stopped. A horse-power of duty has been taken off the motor driving that machine. Multiply, if you please, the ¼ horse-power hours (supposing it to be stopped 15 minutes each hour) by say 50 machines, running under the same average conditions, and you have a total of 12½ horse-power hours saved each hour. Add this 12½ horse-power to the 18 horse-power, our average load, and we begin to approach the estimated load of our factory under former conditions of practice. To this we should add about 12 or 15 horse-power, which would be necessary to drive a line of heavy main belts through the six floors of our factory; and we have a gross result of 42 to 50 horse-power."

U. S. A. GUN LATHES.

[*With Supplementary Sheet of Engravings.*]

The accompanying drawings show the principal features of the turning and boring lathes for guns of 8 to 12 inch caliber now being built for the Government and to be placed in the Watervliet Arsenal. The following general description of this lathe we take from the general specifications issued by the Government:

The turning and boring lathe consists of the bed, headstock, tool carriage, muzzle and breech back rests and boring bar with carriage.

THE TURNING AND BORING LATHE BED.

The bed is composed of parts, as follows:

The headstock part, 8 feet 5 inches long by 5 feet wide, consisting of a single casting.

The tool carriage bed is composed of two sections, each a single casting 21 feet long by 8 feet wide (3 feet wider than the remainder of the bed), to carry the tool carriage on independent shears.

The boring bar carriage bed is composed of two sections, each a single casting, and respectively 21 feet and 27 feet long by 5 feet wide. The total length of bed is thus 98 feet 5 inches. T-slots run the entire length of the bed sections to admit the square heads of the bolts clamping down the headstock, tool carriage, back rests and boring carriage. All sections have horizontal transverse openings in their joint faces, into which keys for preserving the alignmenent are fitted, while the sections are drawn together by means of heavy links and wedges terminating in screw ends that pass through the sides of the beds and are provided with nuts. Transoms or girts connecting the shears are provided at intervals of about 7 feet, their lower portions extending beyond the bed sides for the reception of the bolts employed to fasten the bed to plates which rest on top of the brick piers of the foundation, to which they are in turn secured by foundation bolts and washers. Set screws, whose square heads are provided with locking washers, also pass through and are employed in leveling the bed.

THE HEADSTOCK.

The headstock carries three spindles—the main, cone, and back gear spindles.

The main spindle is to be of hard, close grained cast iron; the mixture is to contain 25 per cent. of cold blast iron. Front bearing to be 20 inches diameter by 24 inches long, and rear bearing 16 inches diameter by 24 inches long, the distance from center to center of bearings being 6 feet 11 inches. The front end of main spindle carries a face plate of 8 feet diameter. This plate is bored out to fit tight over the nose of the spindle, and is drawn up tight against the spindle collar by four screws. A taper pin is fitted into the joint of the spindle nose and face plate bore, and acts as a key. The face plate is provided with four adjustable chuck jaws, actuated by screws journaled in the face plate immediately under their square head, and engaging nuts in the jaw plates. The jaws themselves consist of the jaw plate and jaw proper. The former slides in ways in the face plate and carries the nut, and can be securely clamped by means of six screws, three on each side, engaging rectangular bars lying in T-slots that are formed in the face plate parallel to the jaw slide To the jaw plate any convenient fixture or style of jaw may be secured by means of four bolts, that shown in the drawing being a jaw having a swiveling grip piece, enabling the jaw to automatically take a fair grip on the tapered chase of the gun. The main spindle bearings are to be made of hard, close grained cast iron, having 25 per cent. of cold blast iron. They are bored straight to fit the spindle, and externally coned to fit the headstock. Each bearing is provided at either end with screw heads, to which is fitted a spanner nut. The bearings are longitudinally and radially split entirely through on the bottom, and partially through at lines 120° on each side of this cut. A key is fitted into the headstock to engage the bearing and prevent its rotation. To take up wear, the spanner nut at the large end of the bearing is slacked off and that on the small end drawn up, thus forcing the bearing further into the head and compressing it around the spindle. By this arrangement the circular contour of the bearings is always preserved, and the center line maintained at a constant hight The rear end of the main spindle is provided with a step which transfers all end thrust to the thrust block secured to the rear housing of the headstock. Anti-friction washers of hardened steel and gun bronze are alternately interposed between the step and the adjustable thrust screw of the block. The step is also made use of to carry a bevel gear, which drives the trains of gearing employed to feed tool carriage, boring bar and boring bar carriage.

The cone spindle runs in bronze bearings 12 inches long and 6 inches diameter at front end and 4½ inches at back end; it carries the cone and part of the back gear train, while keyed to its front end is the face plate pinion engaging the internal gear, bolted securely to the back of the face plate.

The cone has five steps for an 8-inch belt, ranging from 20.5 to 44 inches diameter.

The cone on the countershaft is a duplicate of the head cone as regards diameters and width of steps.

Keyed fast to the rear of the hub of the cone is a wide faced pinion; journaled directly on the cone shaft is a quill extending through the cone and having the latter journaled upon it. To the rear end of this quill is keyed a pinion of the same diameter as the wide faced cone pinion, and keyed to the front end of the quill is a gear close against the front face of the cone. Immediately in front of this gear a gear of the same diameter is keyed to the spindle itself.

The back gear spindle is journaled in bronze bearings below the cone spindle and on the front side of the head stock, and carries a quill free to rotate about the spindle. Keyed to the rear end of this quill is a gear engaging the wide faced cone pinion close to the rear face of the cone, while the forward end of the quill carries securely keyed to it a pinion engaging the gear nearest the front cone face. The back gear spindle has keyed to it, immediately behind the front bearing, a pinion of same diameter as that on the quill, which engages with the large gear keyed to the front end of cone spindle. The rear end of the back gear spindle carries a gear engaging the pinion at the rear of the cone spindle quill; this latter gear is free to slide longitudinally on its spindle, and is provided with a hub extending entirely through the rear bearing. A portion of this hub near the center of its length is grooved, the section of the grooves corresponding to the section of a rack; a pinion, journaled in the bearing and rotated by means of a crank wrench applied to the squared end of its shaft, engages these grooves and causes the gear to slide along its spindle. When the gear is moved up close to the gear on the end of the quill it engages with the wide face pinion on the end of the cone quill.

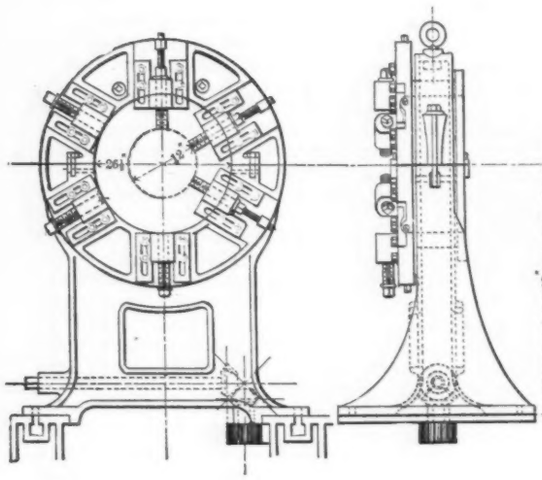
The first reduction of speed from the cone is effected as follows: The sliding back gear is brought forward into engagement with the wide face pinion and driven by it. The front pinion keyed to the back gear shaft then drives the front gear keyed to the cone spindle, and the face plate pinion, on the end of the latter, transmits the motion to the main spindle. For the second reduction, the sliding back gear is moved back and into engagement with the pinion on the rear end of the cone quill; then the cone pinion drives the gear on rear of back gear quill; the pinion on front of this quill drives the gear on end of cone quill (close to front cone face); the pinion on rear end of cone quill drives the sliding back gear, and the front back gear spindle pinion drives front gear on cone spindle, and this drives against the main spindle through face plate pinion and gear.

The face plate pinion has 14 teeth of 1 diametral pitch (3.142 circular), while the face plate gear has 85 teeth. All the back gear pinions have 29 teeth of 1.75 diametral pitch (1.795 circular), and all back gears have 77 teeth of the same pitch. All back gears at rear end have a 4.5-inch working face and those at front 5.5-inch working face. Width of face of face plate gear 7½ inches. By employing two main counter speeds of 166 and 202 revolutions per minute, we obtain 20 main spindle speeds ranging by practically correct geometrical progression from 0.25 to 10 revolutions per minute.

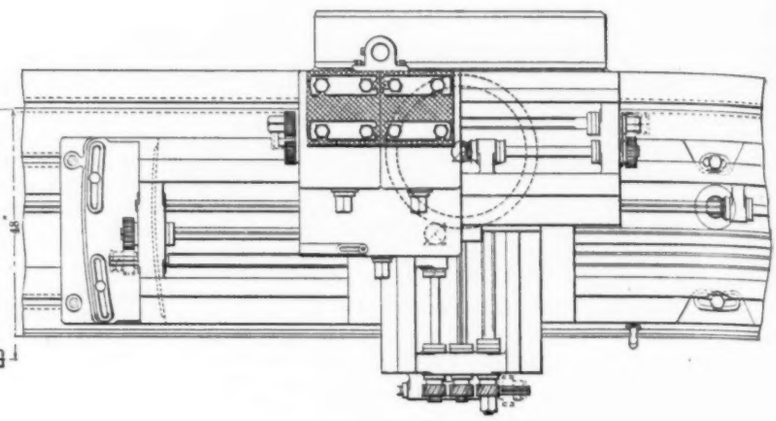
THE TOOL CARRIAGE.

The tool carriage consists of the plate, bolted to the bed in the desired position; the lower or main slide, which is made to swivel on the plate, and is bolted down to the latter; the lower cross slide, capable of a longitudinal traverse on the main slide of 15 feet 7.5 inches; the lower cross shoe, having a movement on the lower cross slide of 27 inches. The lower cross shoe carries the second longitudinal slide, which can be made to swivel on the lower shoe, and in turn carries a shoe and allows the latter a longitudinal motion of 3 feet. This shoe carries the upper cross slide shoe, whose maximum travel is 1 foot 9 inches, though this can be increased by 4 or 5 inches in case of necessity. Two short supplementary slides are mounted on this last slide, each having a travel of 9 inches. The upper surfaces of these slides are faced with 0.5 inch steel plates; four 1¼-inch studs are securely tapped in each, and so placed that the lines connecting their centers form a perfect square; each bar is cut out from the hole to the edge on one end, and from the hole to the side edge at the other end, this arrangement allowing the bars to be set in two different positions at right angles to one another without necessitating the removal of the clamping nuts. The lower surfaces of these nuts in contact with the bars are made to form spherical segments, the bars being correspondingly hollowed out, to prevent all tendency to bend and break the studs, due to clamping the bars in a position not perfectly horizontal. Spiral springs slipped over the studs serve to free the tool of the bar when the nuts are being slacked. The upper swiveling slide carries an extension on its side, to which may be fastened former plates of any desired shape, the slot formed in such plates being engaged by a conical roller, mounted on a stud, detachably fastened to the end of the upper swiveling cross shoe. To allow this latter to be drawn in or out to follow

the contour of the former, the screw is detached by drawing out a pin which passes through the bushing in which the front end of the screw is journaled, and through the body of the shoe. This is accomplished by relieving the front end of the shoe, sliding it toward the edge and then reclamping. The entire carriage is mounted on a plate which is bolted to T-slots in the carriage bed shears by means of six bolts, two at each end and two at the center, these latter also passing through the main slide and aiding to secure it to the plate. Cap screws passing through slots at the ends gears journaled in bearings fastened to the lower surface of the main plate and provided with clutch teeth on their inner faces, to be engaged at will by a clutch splined to the feed shaft, and moved longitudinally on the latter by means of a lever extending through the front side of the plate and convenient to the operator, near the center of its length. Both miter gears are in engagement with a third miter gear journaled at right angles to them in a bearing depending from the bottom of the main plate, and carrying beyond the bearing a pinion engaging a rack secured to the under side of the carriage shear. The rear end of the slide has formed on it a vertical of the slide in bearings projecting from the latter; a second spiral gear keyed to this shaft conveys motion to a spiral gear and imparts it to a second splined shaft extending the entire length of the slide; a screw journaled parallel to this rod has at one end a spiral gear engaging a spiral gear loosely mounted on the transverse shaft at the end of the slide, and having clutch teeth formed on its face for engagement by a splined clutch that may be slipped over the end of the short shaft to drive the spiral gear and through it the screw on which it is mounted. This clutch also has gear teeth formed on its periphery and can be slipped over the

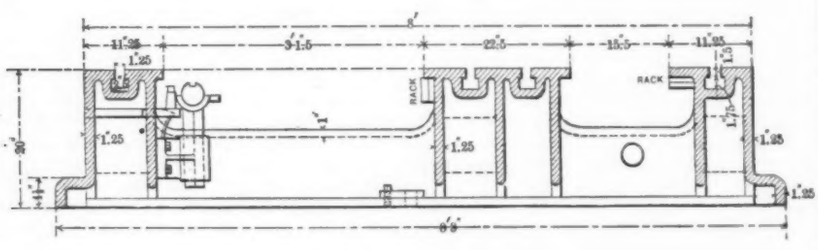


Front and Side Elevation of Steady Rest.



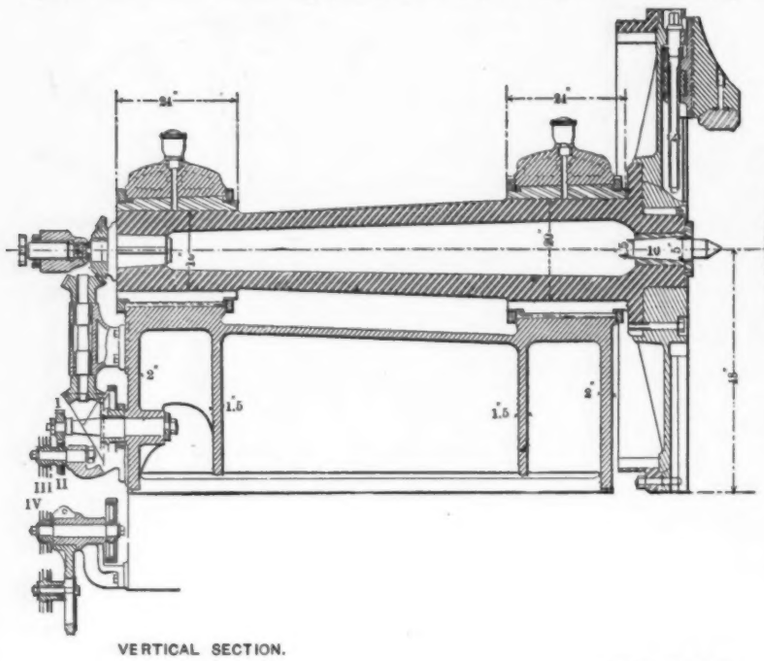
Plan of Tool Carriage.

(two per end) are, besides, employed to fasten the main slide to the plate. To prevent any possible slight lifting of the front edge of the slide from the plate between the central and end clamping screws additional screws are located midway between those at the end and center, engaging square nuts lying in slots formed in the base of the plate. The carriage may be shifted longitudinally along the bed by power or by hand, in which case the clamping bolts are slacked sufficiently to allow the entire weight of the carriage to come on the three pairs of rolls journaled in the main plate. These rolls are hollow gear segment, into which meshes a pinion, provided with a squared end for the attachment of a wrench, to be employed in swiveling the slide after the bolts clamping it to the plate have been slacked. This end of the slide is graduated to give variations of taper in diameter of 0.002 inch per 1 inch of length, the graduations to extend 2½° each side of 0 in the plate. Automatic feeds in two directions are provided for the two longitudinal and the lower cross slides, and motion for these is derived from the splined shafts extending the entire length of the tool opposite end of the screw, rotating the latter by conveying motion from a gear mounted on the corresponding end of the second or central feed rod. By thus shifting this gear or clutch the direction of rotation of the screw is reversed, and as the latter engages a nut secured to the base of the slide shoe, this latter is fed in either direction desired. One gear or clutch only is provided, to guard against accidents resulting from an attempt to rotate the screw in opposite direction through neglect of the operator to remove one or the other. In the drawings such removable clutches or gears are shown in position by dotted lines. Extending through the bottom of the lower cross slide is a short vertical shaft carrying miter gears on either end, the lower one of which engages a gear journaled in the bottom of the slide, and driven by the splined shaft extending the entire length of the main slide, while the one at the upper end engages a miter gear journaled in the recess in the upper portion of the cross slide and drives a splined rod extending the entire length of the latter. This rod carries at its front end a spiral gear engaging a similar spiral gear mounted on a shaft lying below it across the front face of the slide and journaled in bearings projecting from the latter. A second spiral gear keyed to this short shaft conveys motion to a second splined rod, also extending the entire length of the slide, by means of a spiral pinion at its end. A screw is journaled parallel to this rod, and carries at its forward end a spiral gear which engages another spiral gear loosely mounted on the short front shaft and having clutch teeth formed on its face, to be engaged by a splined clutch that may be slipped over the end of the short transverse shaft, driving the spiral gears and consequently rotating the screw. This clutch has gear teeth formed on its face, and can be slipped on the rear end of the screw, rotating the latter by convey-

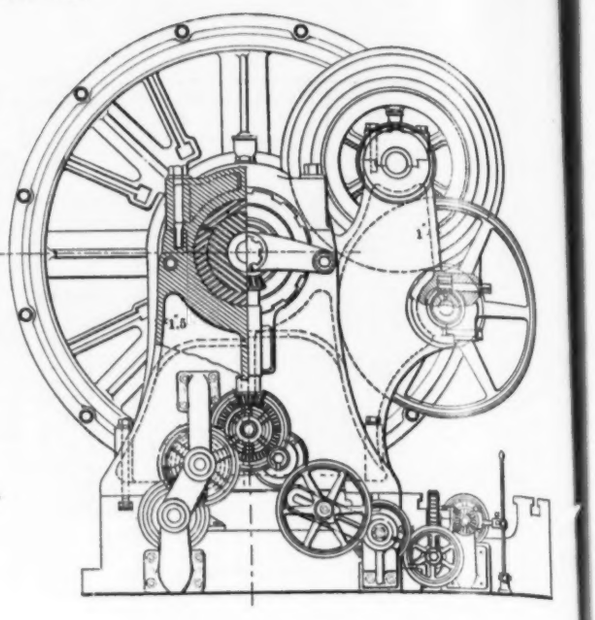


Cross Section of Bed.

and secured to axles. The radii of the rolls are slightly greater than the distances from the shears to the roll centers, so that clamping the plate down compresses the rolls, which will, on the bolts being loosened, regain their original shape, at the same time raising the carriage clear of the shears. A pinion journaled on the front side of the plate, near the center of its length, engages a rack fastened to the front side of the carriage bed, and will, when rotated by a ratchet wrench applied to the upper squared end of its shaft, feed the carriage along. Power movement is derived from a splined shaft extending the entire length of the carriage bed, and having loosely mounted upon it a pair of miter carriage bed and by mechanism as follows: A miter pinion journaled in a bearing projecting from the under side of the bed plate derives motion from the splined feed shaft, along which it is free to travel with carriage, transmitting this motion to a miter mounted on the lower end of a short vertical shaft extending through and journaled in the swivel of the main slide, and carrying at its upper end a miter gear, which in turn rotates a feed rod extending the entire length of the slide by means of a miter splined to the shaft and journaled in the slide. This rod has at its end a spiral gear engaging a similar gear mounted on a shaft lying below it and journaled transversely across the end

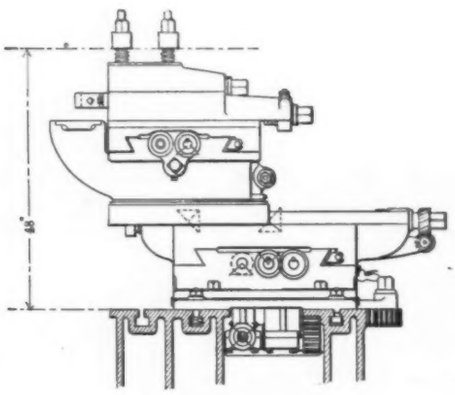


VERTICAL SECTION.

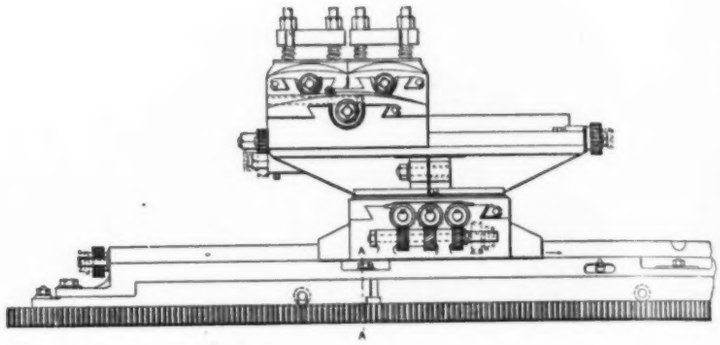


END ELEVATION.

HEAD STOCK

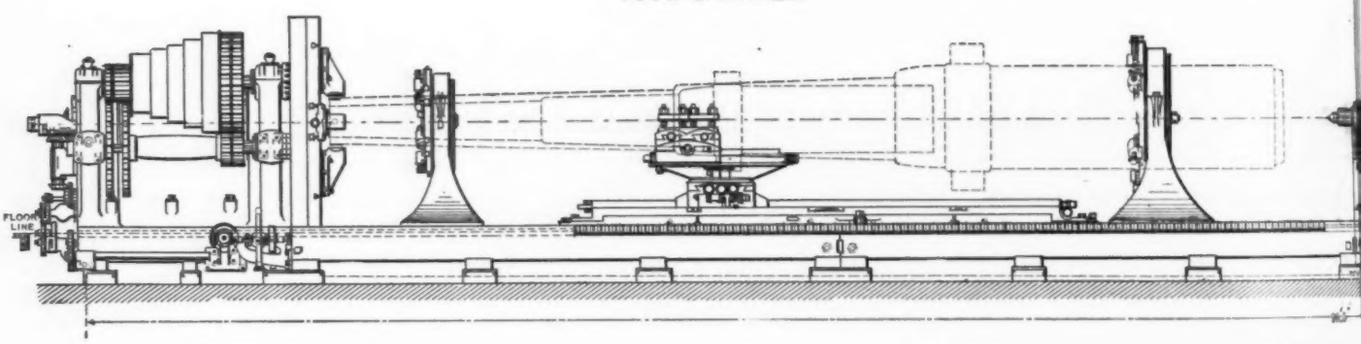


HEAD END ELEVATION.



FRONT ELEVATION

TOOL CARRIAGE.



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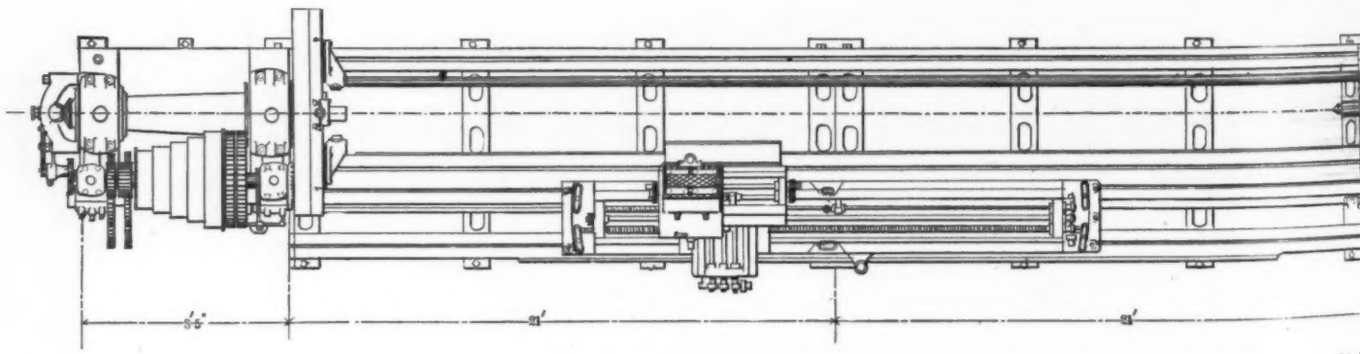

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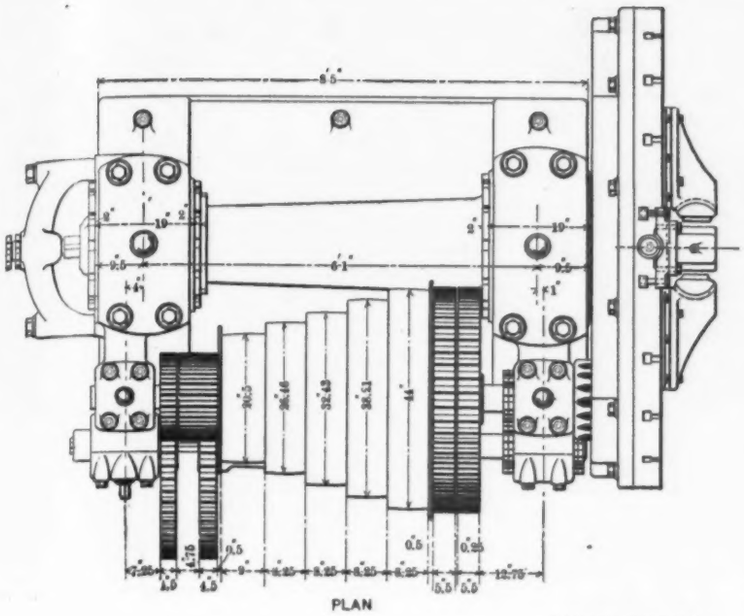
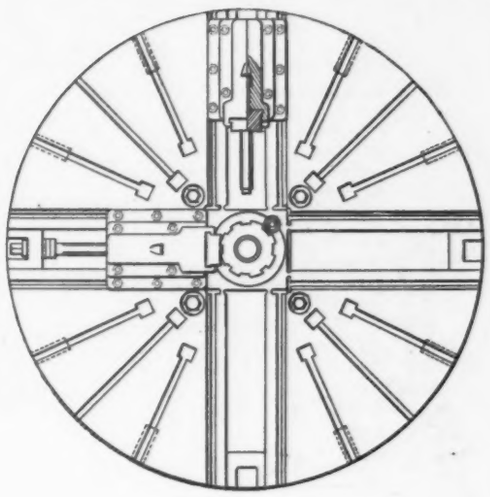
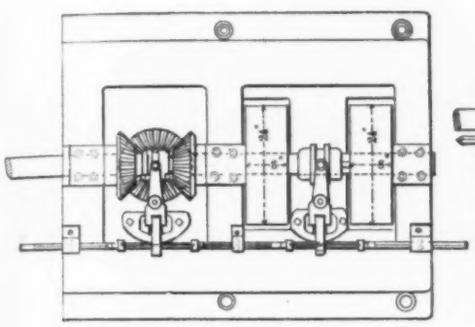


PLAN

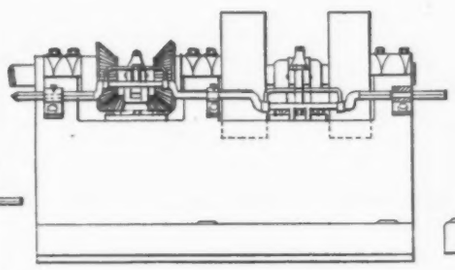


ELEVATION FACE PLATE.

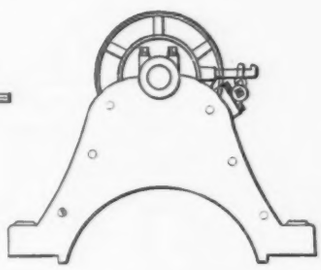
HEAD STOCK.



PLAN.

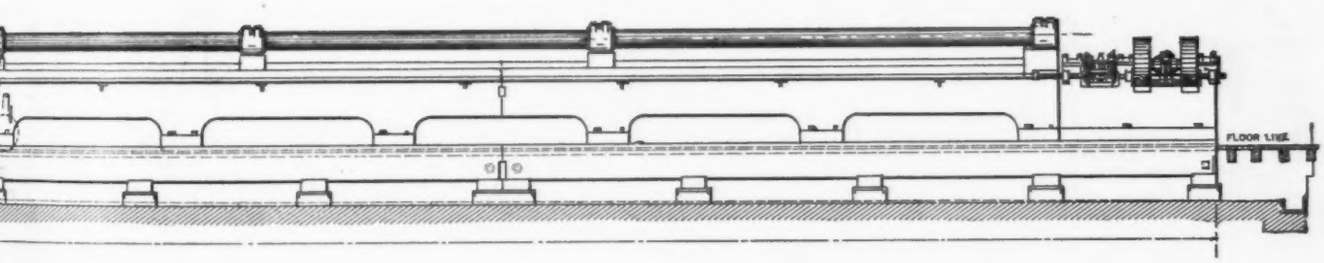


FRONT SIDE ELEVATION.



END ELEVATION.

BORING CARRIAGE.



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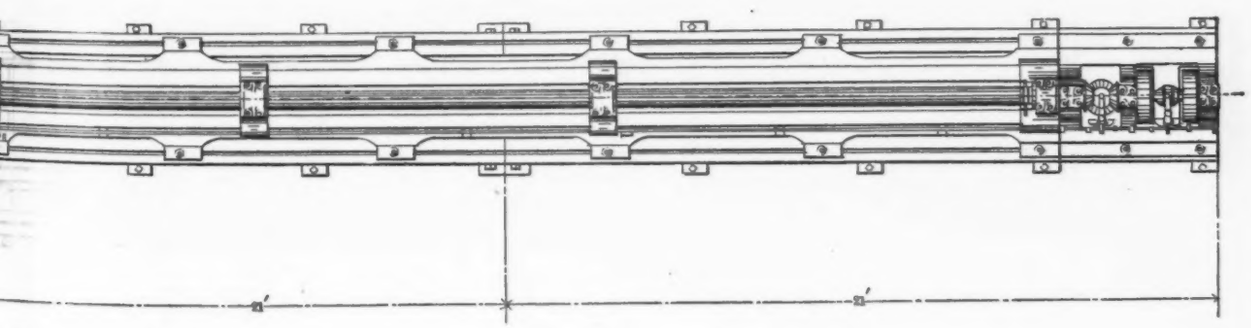

INCH CALIBER, WATERVLIET ARSENAL, U. S. A.

ing motion from a gear mounted on the end of the central rod; by shifting this clutch or gear from front to back the direction of rotation of the screw is reversed, and as the latter engages a nut secured to the base of the shoe the latter is fed in either direction desired. A miter gear splined to the central rod and journaled in the base of the cross slide swivel plate drives (by means of a gear at the lower end of a vertical shaft extending through the center of the swivel and miter gear at the upper end of this shaft) a fourth miter gear journaled in the upper slide and splined to a shaft extending the entire length of this slide. Mounted on each end of this shaft are spur gears, the one at the front driving a screw that is journaled in the slide parallel to the rod, through a removable gear that can be placed on the squared front end of the screw, while the gear mounted on the rear end of the rod drives the screw through the same removable gear, which for that purpose is set on a stud below and centrally between the screw and rod, and a gear mounted on the rear end of the screw; by varying the position of this removable gear rotary motion in opposite directions is imparted to the screw and the slide shoe fed in the direction desired. Hand feed is provided by using a crank wrench on the squared end of the feed screws in place of the removable gears. The main feed screw has a lead of 1 inch per revolution and a double bastard thread, while others have a lead of ¼ inch per revolution and a single bastard thread. All slides are provided with tapered bronze keys extending the entire length of the shoes to compensate for wear. The long tapers on the chase of the gun are turned by swiveling the main slide on the plate, while a former is employed as described for the other irregular outlines. When the former attachment is not in use a flat plate is fitted in place of the former plate to make a bearing for the upper cross shoe on its inward travel. When it is desired to travel the tool carriage past such fixtures on the main bed which would prevent the passage of the tool carriage in its ordinary position, the latter is moved along as far as such fixture will allow, the lower main slide is then swiveled sufficiently to clear the fixture, returning all parts to their original position after passage of the obstruction.

TOOL CARRIAGE FEED MECHANISM FOR TURNING AND SCREW CUTTING.

Motion is conveyed to the feed driving shaft, which lies in the tool carriage bed, from the bevel gear mounted on the end of the main spindle. This gear drives a pinion mounted on a vertical shaft journaled in a bearing fastened to the rear face of the head stock; this shaft carrying at its lower end a bevel pinion engaging a gear mounted on a shaft journaled in the headstock and carrying a change gear at its front end, which drives a gear on the shaft below and to the right of it; this latter carrying at its forward end a second change gear, which, through an intermediate, mounted on a sweep, conveys motion to a change gear mounted on the end of a short shaft journaled in a bearing fastened to the end of the headstock bed, and having on its rear end a gear driving another of the same size, on the end of a shaft lying parallel to the head along the front side of the headstock bed; this shaft carries near its rear end a spur gear, driving another gear of the same size whose hub is journaled in the second bearing of the main feed shaft, and one of whose hub faces is provided with clutch teeth. The shaft journaled in front of and parallel to the headstock bed carries also a worm which drives a worm gear, the latter having at its end a miter gear engaging a miter journaled in the end bearing of the main feed shaft, and provided with clutch teeth on its hub end. A clutch splined to the feed shaft can be made to engage either this last mentioned miter gear or the spur gear, by means of a suitable lever, as shown, thus conveying rapid rotation to the main feed shaft by the spur gears, or motion 12½ times as slow through the worm and miter gearing. The fast speed is employed for screw cutting, while the slow one gives the turning feeds. By use of the gears mentioned in table on the diagram, screw threads, having a lead per revolution of 0.25, 0 3, 0.4, 0.5, 0.6, 0.7, 0.75, 0.8, 0.9, 1.0, 1.25, 1.50, 1.75, &c., up to 3 inches, varying by quarters of an inch, can be obtained, while still others may be had by the use of suitable gears. Cutting feeds will range from 0.02 up to 0.24, the change from screw cutting to turning being simply and rapidly effected by throwing out the clutch mentioned, while by leaving it in the central position the feed shaft receives no motion whatever.

BORING BAR CARRIAGE, DRIVING AND FEED MECHANISM.

The boring bar carriage is mounted on the main bed and bolted to the latter by bolts engaging T-slots running the entire length of the shears. The sections are securely bolted and tongued together to preserve their relative alignment. A housing carrying part of the gearing for conveying feed motion to the boring bar and the pulleys for rapidly moving the same are bolted to the rear end of the carriage—forming a part of the same—and also to the bed. The boring bar is of forged steel, 42 feet 8 inches long by 7½ inches diameter, and has a 4-inch hole extending its entire length, and its front end is tapered out for the reception of the shank of center or tool head. It is supported by four capped bearings, the first one of which is stationary at the front end of the carriage; two intermediate ones are set at equal intervals between the first and fourth, to which last the boring bar is secured between collars. All heads are bushed—the external diameters of the bushings being sufficiently large to permit the use of bushings for an 11-inch bar, should it be found desirable to use one. All heads are adjustably gibbed to the carriage. As the last head moves forward, carrying the bar with it, it comes in contact with the third, pushing that with it, and this will in turn carry along the second; when returning, the third head draws the second back, releasing it at its normal position, being in turn released by the last head at the proper time. To accomplish this a pair of drag hooks are bolted to the front end of the last head, terminating in beveled surfaces, which serve to raise and conduct into the hooks a transverse bar lying in suitable recesses under the third head; this bar extends the entire width of the space between the carriage shears, on the inner sides of which are formed at suitable points lugs beveled toward the front, which serve to lift the bar out of the drag hooks as it is carried over them by the return movement of the head. A similar arrangement is made use of between the second and third heads. A screw extends the entire length of the carriage between the shears and is journaled at the rear in the housing bolted to the carriage and supported on each carriage transom by a bearing embracing one-third of its circumference; a nut engaging the remaining two-thirds is attached to the rear head; this nut is made in halves, which are connected by a right and a left hand screw, to allow ready detachment of the head from the screw. Loosely mounted on the rear end of the screw are a pair of friction pulleys (which must be what are termed "rim frictions" of approved design), which impart rapid rotation to the screw in different directions, on being set up by the usual spool sliding on the screw between them. For the boring and reaming feeds the screw carries in the rear housing, and in front of the friction pulleys, a pair of loose miter gears provided with clutch teeth on their inner faces for engagement by the clutch splined to the screw between them; these miters derive rotation from a third miter mounted on the upper end of a vertical shaft journaled in the housing, and carrying at its cone end a miter gear driven from its mate mounted on the inner end of short horizontal transverse shaft, receiving motion from a worm driving a worm gear mounted on the short shaft. The shaft carrying the worm is splined and extends the entire length of the main bed through to the head end, being supported by automatic drop bearings for that portion of its length traversed by the boring carriage. Rolls situated in the feet of the boring carriage and journaled in spring frames serve to take the weight of the carriage, when the clamping bolts are slacked, to permit of a free movement along the main bed by the operator, who rotates a short vertical shaft near the front end of the carriage by means of a ratchet wrench applied to its upper squared end; mounted on the lower end of this shaft is a pinion which engages a rack secured to the inner main bed shear. For power traverse of the carriage, a miter gear is keyed to the above mentioned short vertical shaft, which is driven by its mate on the forward end of a horizontal transverse shaft having loosely mounted upon it, near the back, a pair of miter gears connected by a third, vertically journaled underneath them; the two miters on the shaft have clutch teeth formed on their inner faces, for engagement by a sliding clutch splined to the shaft, and operated by a bell crank lever extending to the front side of the carriage within convenient reach of the operator. A worm gear keyed to the hub of the rear end of the clutch miters is driven by a worm on the splined feed shaft lying in the main bed. A light rod made of tubing runs along the front side of the carriage, and is connected at the front end to a handle pivoted on the carriage, by which it is thrown to the right or left, engaging the gear or pulley, giving a back or forward motion to the bar. Adjustable dogs on this rod are struck by a tappet attached to the rear bar head, thus automatically controlling the length of the stroke. The shifting mechanism is so arranged that it is impossible to engage two feeds or any feeds in different directions simultaneously; a portion of the rod at its rear end and a portion at the front of housing and carriage is squared, and slides through square bearings, that portion of each square which rests in these bearings, when both clutches are thrown out of engagement, being turned cylindrical to permit rotation of the rod; when in that position, by means of a handle attached to its front end—the normal position of the operator—a portion of the rod centrally between these two squared portions carries a spline on each side of a short bearing set in the center of this section, which splines are in line with keyways cut through the bearing only when the rod is rotated to either limit, thus permitting an endwise movement of the rod at such time only. Those portions of the rod in front of the gear clutch and friction spool are cranked in opposite directions, the cranks being arranged to stand vertical when the rod is at either limit of its angular movement. On each side of the center of each crank are lugs projecting from it and away from the rod. These lugs, when the cranks are thrown up, engage the end of the forked levers attached to the gear clutch and friction spool, which levers swing on vertical pivots between the rod and screw, and whose rear ends—or those portions

engaged by the lugs on the cranks when thrown up—are horizontally pivoted, and will, when the cranks are thrown down, drop into locks, thus preventing any possible movement of the levers around their vertical pivots tending to shift clutch or spool. To further insure this locking yokes are attached to the cranks and passed over the top of the rear portion of the forked levers, compelling their downward movement in unison with that of the cranks. A further advantage of the use of these yokes lies in the fact that that it will be impossible to rotate the rod and shift it endwise should any accidental obstruction prevent the safe locking of either lock.

Motion is imparted to the shaft lying in the main bed from the live spindle by the bevel gear on the step, the bevel gears mounted on the vertical shaft, and the bevel gear driven by the lower one of those on that shaft, all of which also form part of the tool carriage feed train. This last bevel gear has formed on it a spur gear and keyed to its hub a spur gear of half the diameter of the other; these two spur gears are in engagement with a pair mounted on a shaft below and to the left in such manner that one or the other can be connected to the shaft by a spline, or both disconnected, imparting to the shaft two different speeds, one four times as fast as the other, or permitting the shaft to remain idle while the gears simply rotate around it.

Permanently keyed to this shaft is a cone of four gears, which drives a cone of four similar gears mounted on the end of the long splined feed rod extending the length of the main bed; these last gears are also so arranged that any one of them can be at will locked to the shaft, imparting to it its rotative speed, giving eight different feeds to the boring bar.

The usual device of a push spline employed to engage any one of a nest of gears is objectionable, owing to the attendant cutting away of too large a portion of the bearing surface of the gears on the shaft, and the device here shown in detail is to be made use of.

The shaft carrying the gears is bored out and a rod fitted into it whose inner end is eccentrically bored out a short distance; tapped into the base and passing through the center of this eccentric hole is a bolt which secures a cap closing the hole, and also bored out to a slight depth to match the eccentric hole in the rod; a flat spline, recessed on its inner edge to rest against the screw, and having teats projecting from each side near the inner edge, is passed into the eccentric hole from the side; a portion of the wall of the rod opposite the eccentric hole is slabbed out to pass the spline, when the rod is given a partial rotation, which will carry the spline inward, and draw it out of engagement with the keyway in the gear hub, the shaft being suitably slotted to permit passage of the spline; a reverse rotation of the rod will push out the spline and force it into the keyway as soon as that is brought opposite it by the rotation of the gear. The slot cut through the shaft is, of course, of sufficient length to permit the spline to be brought opposite any one of gears as required.

To prevent possible engagement of two gears simultaneously, a thin washer is laid between adjacent gears, on which the spline will rest when in an intermediate position.

Concentric grooves are turned in the rod, which are engaged by a pin forced into them by a spring when the spline is in engagement with any gear or in an intermediate position, while concentric markings on the projecting portion of the rod in connection with a pointer indicate the position of the spline.

GENERAL DIMENSIONS.

Speed of main counter, 166 and 202 R. P. M.
R. P. M. of main spindle from 0.26 to 10—20 speeds.
Cones, five steps of 20.5, 26.46, 32.43, 38.21 and 44.0 for 8-inch belt.
Main spindle front bearing, 20 inches diameter by 24 inches long.
Main spindle back bearing, 16 inches diameter by 24 inches long.
Cone spindle front bearing, 6 inches diameter by 12 inches long.
Cone spindle back bearing, 4.5 inches diameter by 12 inches long.
Back gear spindle front bearing, 5.5 inches diameter by 12 inches long.
Back gear spindle back bearing, 6.5 inches diameter by 14 inches long.
Face plate, 8 feet diameter.
Vertical hight from top of shear to center, 4 feet.
Range of tool carriage on bed, power and hand, 21 feet.
Travel of main longitudinal slide, power and hand, 15 feet 7⅛ inches.
Travel of main lower cross slide, power and hand, 2 feet 3 inches.
Travel of second longitudinal slide, power and hand, 3 feet.
Travel of upper cross slide, 1 foot 9 inches.
Travel of upper auxiliary cross slides, each 9 inches.
Free swiveling motion of main longitudinal slide each side of 0 to 2½°.
Free swiveling motion of second longitudinal slide each side of 90°.
Power feed per revolution of gun from 0.02 to 0.24 inch.
Boring bar, 42 feet 8 inches long, 7.5 inches diameter, 4 inches clear hole.
Boring bar travel, 37 feet.
Boring bar rapid traverse forward, 28 F. P. M.
Boring bar rapid traverse backward, 56 F. P. M.
Headstock bed section..... 8 ft. 5 in. x 5 ft.
Tool carriage bed section, two at 21 feet.....42 x 8 feet.
Boring bar carriage bed section, one at 21 feet and one at 27 feet.....48 x 5 feet.

Total.....98 feet 5 inches.

Maximum diameter taken in by face plate chuck, 50 inches.
Minimum diameter taken in by face plate chuck, 10 inches.
Maximum diameter taken in by breech rest, 48 inches.
Minimum diameter taken in by breech rest, 30 inches.
Maximum diameter taken in by muzzle rest, 26.5 inches.
Minimum diameter taken in by muzzle rest, 12 inches.

We expect, in an early issue, to describe the methods and appliances employed by the Pond Machine Tool Works, of Plainfield, N. J., in the building of these massive tools.

Hot Blast Steam Heating Apparatus.

One of the most important subjects to be considered by those erecting factories and manufacturing establishments is the question of the system of heating and ventilating to be employed. By means of the accompanying illustrations we are enabled to show a system for heating buildings, which will bear examination by those interested in this subject. By this system the entire quantity of radiating surface is massed together into manifold sections, as shown in the drawings, these sections differing in size and number, according to the number of cubic feet of air to be heated. The entire heating surface consists of steel tubing, and is encased in a steel jacket. A duct conveys fresh air, taken directly from outside the building,

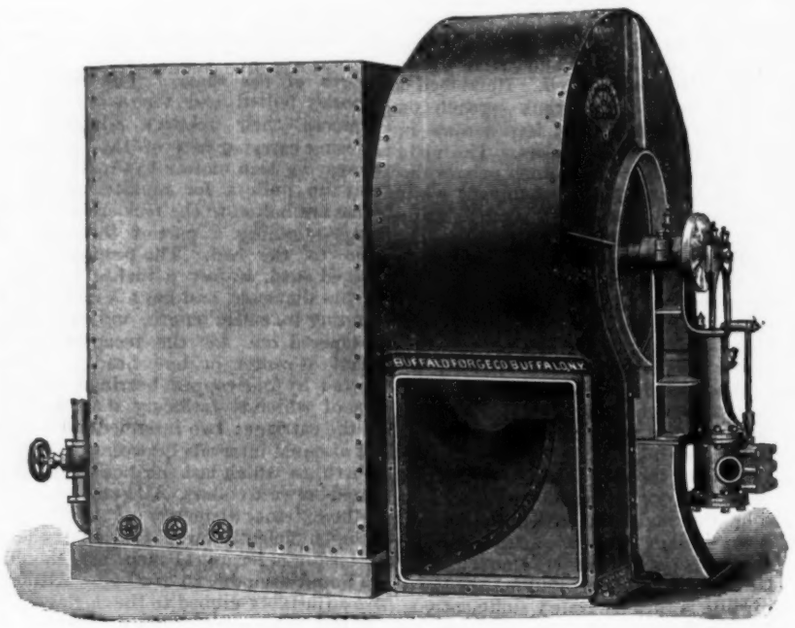

Fig. 1.

BUFFALO HOT BLAST STEAM HEATING APPARATUS.

which is either forced or exhausted over the steam pipe, from whence it passes through conveying air pipes or ducts to different portions of the building. A distribution of air entirely independent of all other conditions is thus obtained, and a uniform temperature is secured in all parts of the building, both at floor and ceiling, without reference to outside temperature. The manufacturers of this apparatus—the Buffalo Forge Company, of Buffalo, N.Y.—call particular attention to the complete control of the heating surface, either when using live or exhaust steam, or both. This feature is secured by a patented valve placed between each section, as shown in Figs. 2 and 3. The cages in which the valves are fitted are made suitable for the different sizes of manifolds, and are fitted to receive a brass nut into which the valve stem screws. Fig. 4 shows the general form of the valve, which is so constructed as to prevent any possibility for it to stick, leak or become obstructed, and is made of such material as to prevent corrosion or rusting. The only packing used in its construction is that in the stuffing box around the valve stem. The claim is made that by concentrating the steam pipe, as is done in this system, a greater duty is secured for any stated number of

feet of pipe, and it is further stated that actual experiments have shown that one-fifth of the amount of lineal feet of 1-inch pipe required to heat a given number of cubic feet of air by direct radiation will give equally as much heat when arranged in the form of a hot blast heater and distributed by a fan. When steam is turned off during hot weather, and the fan is kept running as usual, the apparatus will maintain a constant circulation of fresh, cool

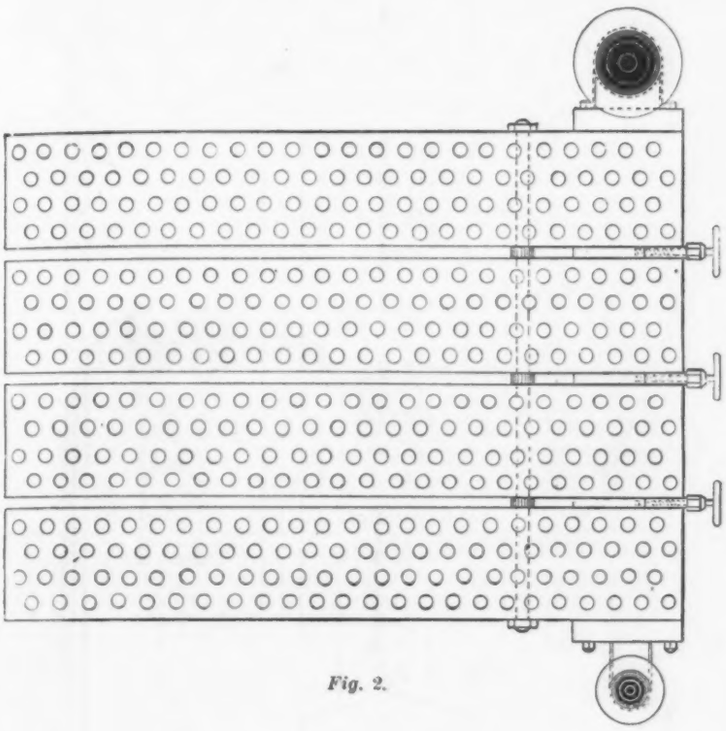

Fig. 2.

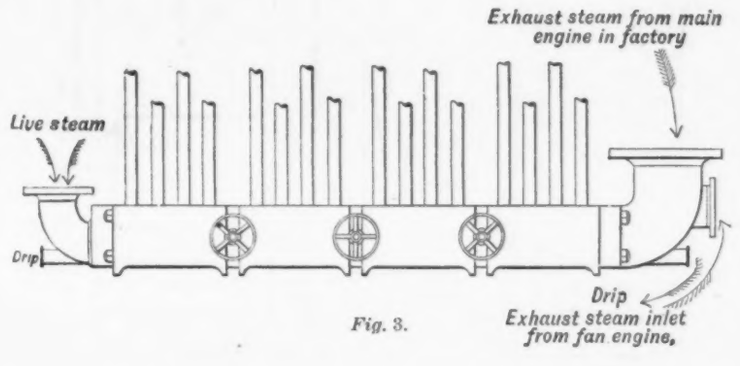

Fig. 3.

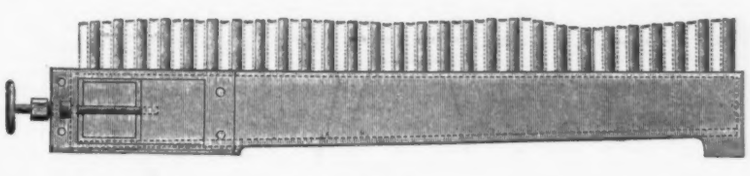

Fig. 4.

air throughout the building. By this system, it is asserted that labor, care and expense are reduced to a minimum, and no risks from fire are incurred.

Secretary Tracy has decided to add 16 feet to the length of the Department designs for the three new battle ships, instead of 12 feet, as proposed by the Cramps. This will make the total length of the ships 348 feet, and the displacement will be increased to 10,100 tons at the normal load line, being a gain of 700 tons, which will be utilized to strengthen the batteries of the ships and increase their armor protection. The armor protection to the 8-inch guns will be increased from 6 inches in thickness to 10 inches, and the protection to the 6-inch rapid fire guns will be increased from 4 to 10 inches. The water line armor will be increased by carrying the maximum thickness of 18 inches down to 12 inches below the normal load line, instead of 6 inches, before it begins to taper off to 10 inches at the bottom of the belt. In consequence of this further increase in the length of the vessels, a readjustment of the contract prices is necessary, and the compensation of the Cramps will be increased from $3,020,000 to $3,063,333 for each of the vessels they are to build. The Union Iron Works will receive $3,223,333 instead of $3,180,000.

Assistant Secretary Spaulding has written to the Collector of Customs at San Francisco in regard to certain steel rails now in bonded warehouses which have been withheld from sale from time to time at the request of the Oregon Pacific Railway Company. It is understood that the railway company intend to withdraw the rails and pay the duties thereon in a short time, and the question arises as to whether they are dutiable under the old or the new tariff law. General Spaulding says that as the duties, regular and additional, had accrued on the rails before the passage of the act of October 1, 1890, and as the rails remained in bond merely by sufferance and not legally, they do not come within the purview of Section 50 of the act of October 1, 1890, and are therefore dutiable under the old law.

VIRGINIA IRON NOTES.

The Rockbridge Company are negotiating for the establishment of nail works at Glasgow.

The Duval Engine Company, whose plant is to be moved from Zanesville, Ohio, to Roanoke, will be capitalized at $60,000, with power to increase stock to $150,000. The president of the reorganized company will be E. H. Stuart. Work has begun on the buildings, and is under contract to be completed within three months.

The Richmond Sash Holders and Malleable Iron Novelties Company have been organized at Richmond, with $50,000 capital stock. The company own a patent on a sash holder, adapted to railway car windows. The plant will be erected at once. The officers are: S. H. Bowman, president; A D. Wilkinson, vice-president; John J. Mayer, treasurer, and George Crutchfield, secretary.

A company, with a capital stock of $200,000, are reported organized at Roanoke, to erect and operate a rolling mill.

At Stanley, a 100-ton ferromanganese furnace is to be built, also a 200-ton iron furnace. Other enterprises reported assured and preparing to locate are a rolling mill, a nail and tack factory and a saw and file works.

The Standard Iron Company, with a capital stock of $300,000, have been organized at Salem by W. W. Brand, F. G. Weber and others, to develop iron and other mineral properties near Mason's Cove.

It is expected that work will begin this week on the new steel plant at Buena Vista. All the details have been arranged and the contract closed.

W. W. Hamilton, John Donovan and others, of Clifton Forge, have formed the Rich Patch Iron Mining Company, with $500,000 capital stock, to open mines, erect furnaces, establish rolling mills and locate other industries.

A company has been organized to build and operate a 100-ton iron furnace at Front Royal. The ore to be used in this furnace is to be gotten from the hills adjacent to the town and belonging to the same company. It is stated that negotiations are pending for the establishment of other iron enterprises.

The Hydraulic Packing Company, with a capital stock of $5000, have been organized at Richmond for the purpose of manufacturing, buying and selling of all kinds of belting and general machinery supplies. Edward H. Garcin is president, S. P. Mayo vice-president, H. A. Williams secretary and treasurer, with all of the above and William M. Archer as directors.

The American Steel Fire Proof Car Works Company are preparing to erect a plant at Glasgow that will cost about $1,000,000 and from 500 to 1000 workmen will be employed. The plant will occupy a space of 17 acres.

Edward Corbett and others, of Washington, D. C., will erect in Salem a $100,000 foundry and machine shops. The work on the buildings will commence at once.

The Alpine Safe Company, of Cincinnati, Ohio, will move their plant to Glasgow. They will obtain both their hydraulic cement and their wrought iron at Glasgow.

The Norfolk Industrial Development Company have been incorporated at Norfolk for the purpose of inducing manufacturers to locate in that city. The following are the officers: Barton Myers, president; T. F. Rogers, vice-president; George W. Black, treasurer; Parke Poindexter, secretary; the directors are S. L. Foster, R. M. Hughes, McD. L. Wrenn, F. W. Clarke, J. W. Perry, H. G. Williams, W. W. Tunis, J. H. Dingle and Walter Sharp. The capital stock will be between $500,000 and $1,000,000.

The new West End Furnace, at Roanoke, will go into blast shortly. The rolling mills being erected by the same company will be pushed to an early completion.

The Fee & Fowler Belt, Pulley Rest and Mill Company, of Cincinnati, Ohio, will establish a plant at Glasgow.

A. E. Humphreys and Frank Woodrum, of New Castle, and Robert Ballard, of Cincinnati, have bought 100,000 acres of mineral and timber land in the vicinity of New Castle

The Worcester Steel Works.

The Investigating Committee, consisting of A. D. S. Bell, of Boston; C. A. Vialle, of Boston; W. G. Davis, of Portland, Maine; S. H. Whidden, of Boston, and L. S. Tuckerman, of Boston, appointed at the creditors' meeting of September 16, to investigate the financial condition of the Worcester Steel Works, have been busily engaged ever since their appointment in looking into the company's affairs and preparing a report thereof. Having concluded their labors the creditors met at the Parker House, Boston, on Monday, October 6, a large number of the creditors being present. A. D. S. Bell, chairman of the Investigating Committee, reported that experts had been engaged to appraise the company's works, and that they are very unanimous in their opinion as to the value of the property. The assets were found to be:

Cash on hand	$2,380
Book accounts called good	19,107
Merchandise on hand	50,894
Stock on hand	75,566
Total	$147,947

The indebtedness was found to amount to $641,313, of which $55,000 is amply secured, leaving an indebtedness to be taken care of of $586,313, with which there were assets amounting to $157,947 to liquidate the claims. It is thus seen that the liabilities exceed the assets by about $438,500. The committee, therefore, recommended that the company either make an assignment or that it be declared insolvent. It was further claimed that the property of the company is of such a nature that it has got to be managed in a very judicious manner in order to realize anything like what ought to be received from the sale of such an extensive and valuable plant.

President G. M. Rice then stated that the works had made a voluntary assignment as a precautionary measure to save attachments being placed upon the property. The assignment was recorded in Worcester on the morning of October 6. He had named as the trustees Messrs. A. D. S. Bell and W. L. Horne, of W. M. Horne, of Boston, who had been the steel works' selling agents in Boston for several years past. President Rice also said that he had already made an assignment of all his personal property for the benefit of creditors and everything was in the hands of the assignees.

Theophilus King, vice-president of the National Bank of the Redemption, of Boston, introduced a motion that the report be adopted and that the gentlemen named by President Rice as trustees be so accepted by the meeting. Mr. Bell demurred, explaining that he was placed in an awkward position, as he had peremptorily told President Rice several days ago when the idea of an assignment was first discussed that for several reasons it would be impossible for him to serve as one of the trustees. Finally, after considerable debate, Mr. Bell agreed to accept the appointment, at any rate for the time being. The meeting then adjourned.

A case involving important questions relating to the rights of labor organizations was decided by Vice-Chancellor Greene, at Trenton, N. J., on the 21st inst. Jacob Hand and Henry Zimmerman sought admission to the Journeymen Stonecutters' Association, of Newark, and, being refused, were unable to obtain work in that city. Consequently the men sought relief in court. The Vice-Chancellor decides that a voluntary society cannot be forced to admit members whom it does not want, and also that, by a State law passed in 1883, such organizations as the Stonecutters' Association are no longer unlawful combinations.

Natural Gas in Pittsburgh.

The announcement that the supply of natural gas to manufacturers in Pittsburgh would be cut off is construed by the Pittsburgh editors to mean that they must pay as much per foot as private concerns. In any case the *Dispatch* argues that few of the iron works will suffer serious inconvenience. "A number of the large manufacturers have already found it economical, and in every way advantageous, to have their own independent gas supply. The Equitable Company are owned by manufacturers who supply their own works. The Carnegies likewise have their own gas. The extensive Oliver firms have built the large Monongahela line for themselves and other customers; and Jones & Laughlins will soon have a system of

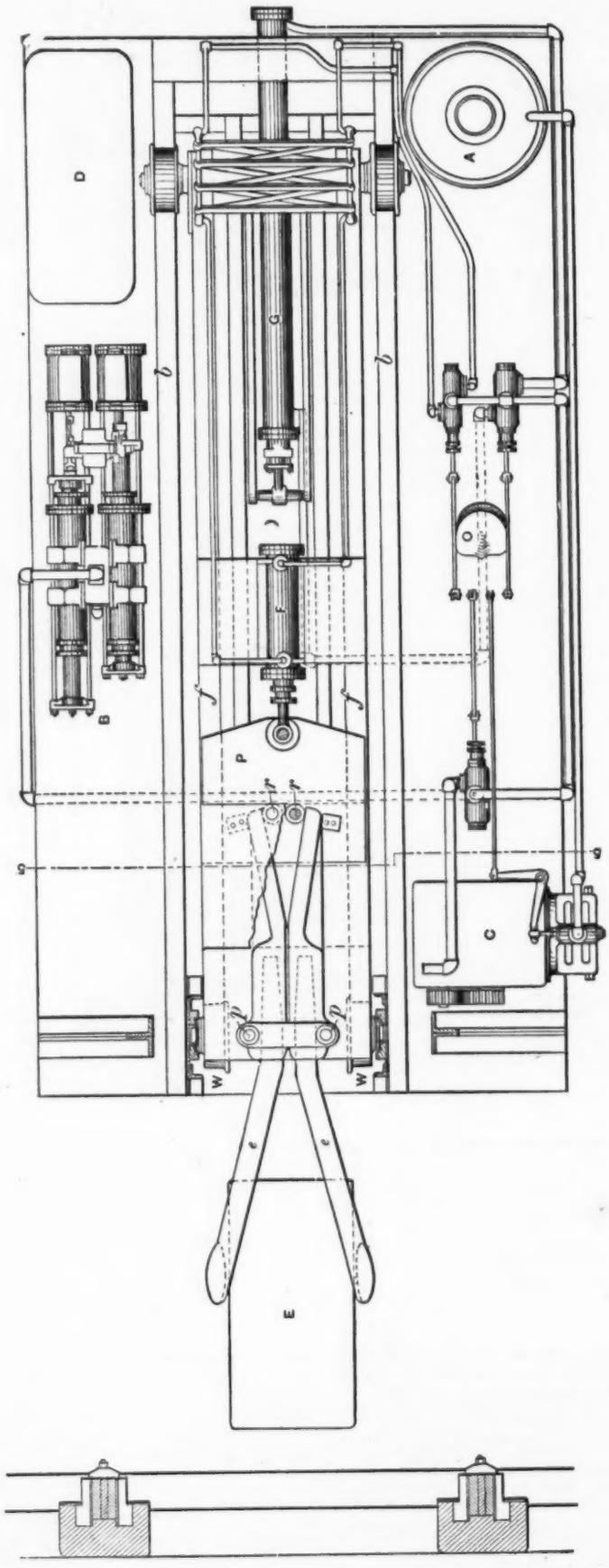

Fig. 1.—Plan of Machine for Handling Plate Ingots up to 5 Tons.

pipes flowing all the gas they want from unbounded fields in Washington County. All around the city, at distances not too far for transportation, there are still many thousand acres of gas territory available; and if, like the foolish virgins, there are any considerable number of heavy manufacturers who have thus far left their lamps untrimmed, the way is yet open to them to band together and bring in their own fuel." The Pennsylvania Tube Works Company will not be so badly embarrassed, as they have a plant of their own almost completed.

The Maine shipbuilding record for 1890 will present a better showing than it did in 1889, which was the best since the palmy days of wooden square riggers. The big schooner still ranks first in importance. The Shenandoah, on the stocks at Bath, will measure nearly 3500 tons and with a single exception will be the largest sailing vessel afloat. Knox County will this year put out 26 vessels, mostly of large size. Iron lower masts are coming into general use, and metal yards and top masts will come when pine becomes scarcer.

Augustus P. Smith, M.E., announces his withdrawal from the late firm of Butterworth, Hall, Brown & Smith, of Washington and Chicago, for the practice of patent, trade-mark and copyright law. Mr. Smith will also give special attention to determining the novelty of inventions and the validity and scope of patents, and will practice general law business of all kinds.

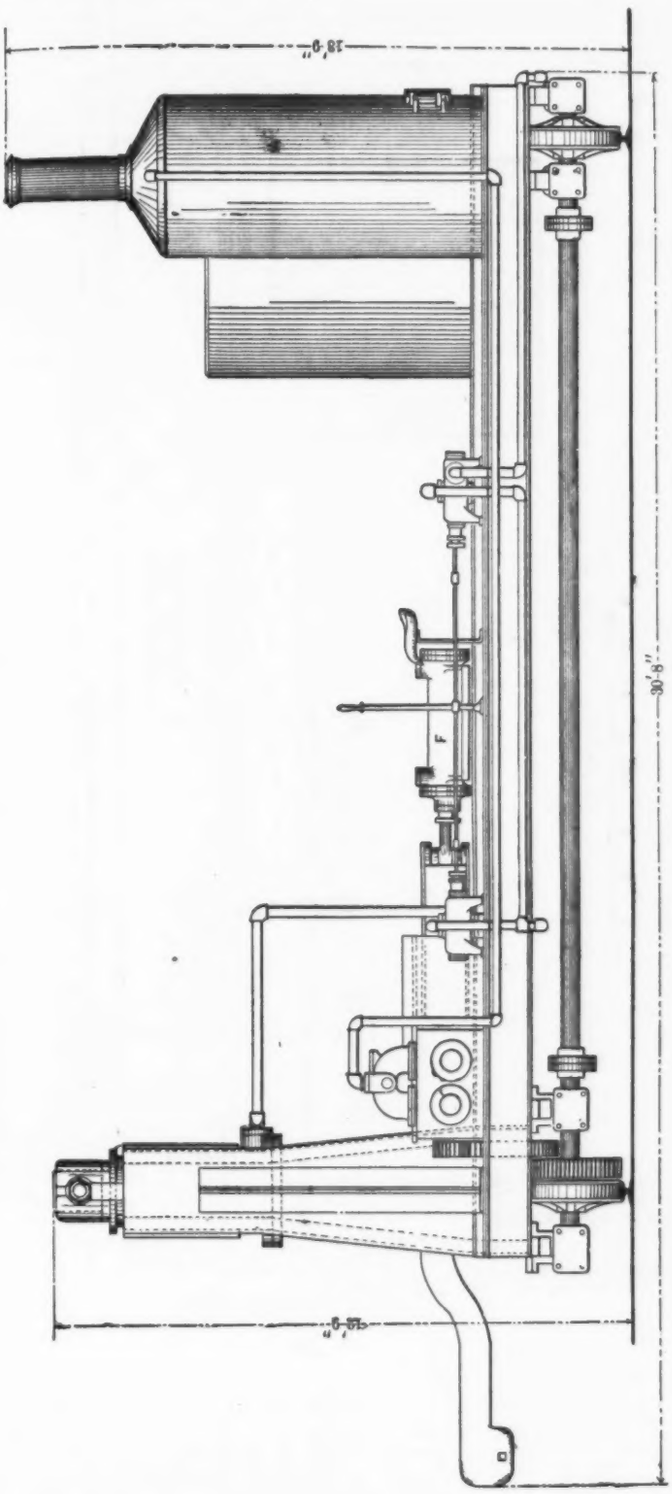

Fig. 2.—Side Elevation Fig. 1.

Machinery for the Charging of Heating and Melting Furnaces.*

BY S. T. WELLMAN, THURLOW, PA.

The gradual change within the last few years from wrought iron to steel for many purposes, notably for rails, plates, beams and other structural shapes, has brought the desirability and possibility of casting and rolling the steel in very large masses as compared with the smaller piles worked and welded in the case of wrought iron. Many advantages are gained in the way of economy by making steel ingots as large as can easily be handled. In casting the ingot it costs no more for labor to handle with a hydraulic or other power crane an ingot or mold weighing 2 to 3 tons than if it weighed 500 pounds or less. The product at the blooming or plate mill is very much larger and the labor per ton very much less; and the saving in scrap in consequence of the long plates or blooms made from the heavy ingots, and the resulting smaller number of waste or crop ends, is a very important item. The improvement in quality, as a result of more work, is one of the most important effects of the increase in size and weight of ingots. Last, but not least to the manager of the works, is the ease with which the product of any plant can be handled in and out of the pit in the case of say, 3-ton ingots, compared with the trouble, delay and expense caused by the casting pit if the same product has to go into 800 or 900 pound ingots. This can be fully appreciated only by the steel works manager who has been through the experience.

To get the full advantage of large ingots and consequent large product at the blooming or plate mill, proper apparatus should be provided for carrying the ingot into and taking it out of the heating furnace. This part of modern rolling mill machinery, it has seemed to the writer, has not kept pace with the rest, and it is the object of this paper to describe a machine which has been designed to do this work.

One of the most common methods of charging ingots into the furnace is by lifting them from the car on which they are brought into the mill by means of a long "peel," which is suspended in a crane, the opposite end being balanced and guided by a number of men. The ingot is swung into the furnace, rolled off of the peel by tilting it, and so on until the furnace is full.

Another method, and the most common one in this country for rail ingots, is to push them from the car (which is brought immediately in front of the furnace door) with a peel placed under and behind the ingot, a groove being made in the car immediately under the ingot for this purpose. The peel is pushed into the furnace by a chain which is fastened to the end of the peel, passing over a pulley on the car or in front of the furnace and back to a special hydraulic apparatus or crane arranged for the purpose. The ingot is generally pulled out of the furnace with the same apparatus, by means of a pair of tongs fastened to the ingot, or an iron loop which is dropped over it, and to which the pulling out chain is fastened. In either case, the sand bottom of the furnace is constantly torn to pieces by the heavy ingot pulled over and plowing through it, and a great deal of time and labor is taken up in keeping it in order.

The whole operation of charging and drawing, as commonly practiced, is slow and laborious, and takes a number of men to handle the tongs, peels, chains and other apparatus used.

The aim of the machine here described is to do all the work of taking the ingot

* Paper presented at the September, 1890, meeting of the American Institute of Mining Engineers.

from the car on which it comes from the converting or melting house, lifting it up, carrying it into the furnace and placing it wherever desired, dropping or lowering it from the bottom, bringing it out of the furnace, carrying it along in front of the furnaces and depositing it on the table in front of the rolling mill. All the valves controlling the movements of the machine, as well as operating to open the furnace doors, are worked by one operator, who rides on the machine.

In the accompanying drawings, Fig. 1 is the plan of a machine for handling plate ingots up to 5 tons weight; Fig. 2 is the side elevation; Fig. 3 is the longitudinal vertical cross-section of a furnace and car; Fig. 4 is a vertical cross section through the tongs, *e e*, and front elevation; Fig. 5 is a vertical cross-section on line 5 5, Fig. 1; Fig. 6 is the rear elevation.

The boiler, pump and engine for operating the machines are all carried on it. In Fig. 1, A is the boiler, B the hydraulic pump, C the engine for moving the machine along the track, and D the water tank. The ingot is shown at E, and is grasped by the tongs. These are mounted on the end of the moving frame work *f f*, the forward end of which rests on the wheels W W. These wheels are lifted, as desired, by the hydraulic cylinder H, Figs. 3 and 4.

The rear end of the frame carries the wheels W^1 W^1, Fig. 3, which can move forward on the beams *b b*, Fig. 1. This frame is moved in and out of the furnace, as desired, by the hydraulic cylinder G, Figs. 1 and 3.

The machine is mounted on wheels, as shown, and runs on the broad gauge track in front of the furnaces. It is moved by the small reversing steam engine C, which is geared to the axle of one pair of wheels, as shown by the dotted lines in Fig. 4.

The operator's seat is at O, Fig. 1, and the operating handles for all the valves are within his reach.

The ingot is grasped by the tongs, which are closed by moving forward the piston of the cylinder F, Figs. 2 and 3, thus forcing forward the plates P P, carrying the rollers *r r*. As the tongs are pivoted on the pins *p p*, Fig. 1, this closes and holds the tongs on the ingots as long as the pressure remains.

The ingot being lifted from the car high enough to clear the fore plate of the furnace, the operator moves the frame forward with the hydraulic cylinder G until the ingot is in the furnace, when it is moved to any desired place, and the tongs are lowered, opened and removed from the furnace, and are ready for another ingot.

The water is taken to the tongs cylinder F, on the moving frame, through the walking pipes *x x*, shown in Fig. 3.

In removing the ingots from the furnace the operation of the machine is much the same. The ingot, after being removed from the furnace, is carried along by moving the machine on the track with the engine C, and is deposited on the rolling mill table, which extends out between the furnaces.

As to the speed of the machine, the writer has frequently seen one ingot taken out of the furnace and carried to the mill table, the machine going back to the furnace and charging three more ingots within one minute from the time the first door was opened.

The whole crew to handle a product of 100 to 200 tons of ingots per turn, taking the ingots from the cars, putting them through the furnaces and on the mill table, consists of a heater, a helper and the boy that runs the machine. Two Siemens furnaces heat the above product, the one heater attending to both.

In heating cold ingots it has been found that the best way to get a large product is

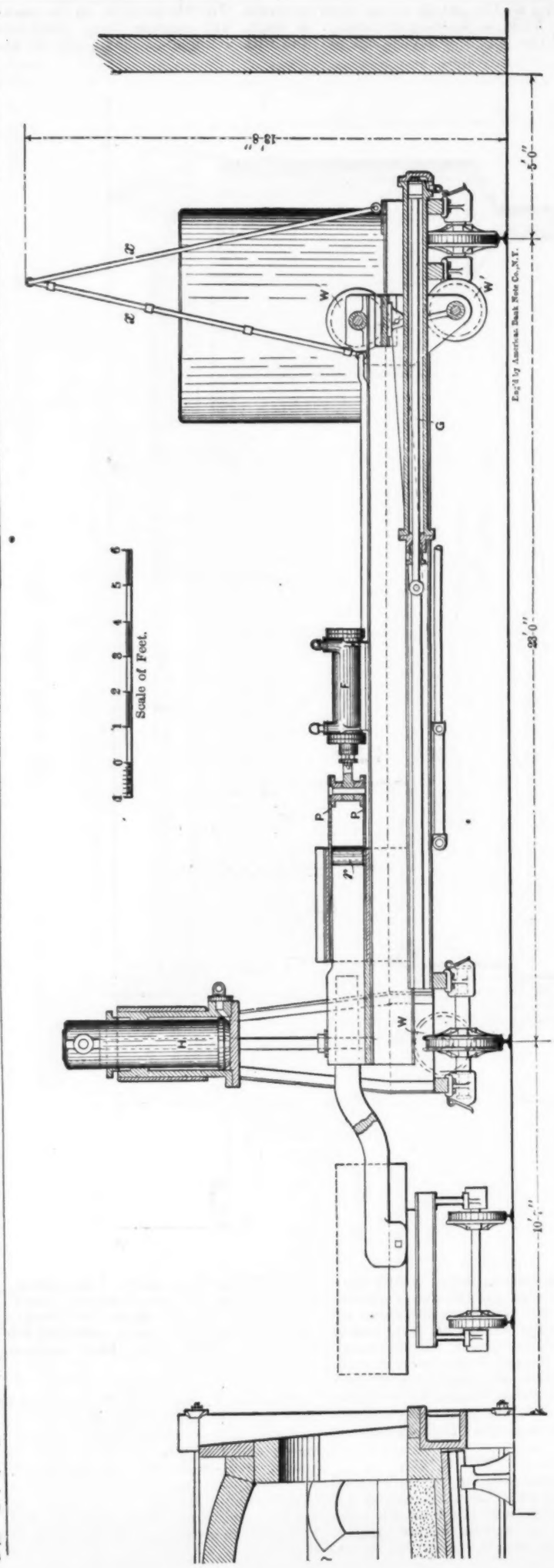

Fig. 3.—Longitudinal Vertical Section and Cross Section of Furnace and Car.

to heat the ingots to a red heat in one furnace, and then take them out and remove them to a furnace which is kept up to the full heat required for rolling, both furnaces being kept nearly full of ingots all the time.

This practice would only be possible with a machine capable of handling the ingots very quickly and with little labor.

The paper also describes and illustrates an adaptation of a somewhat similar machine. It is designed, however, for charging the materials into open-hearth furnaces, the idea being to save not only time and labor in charging, but also one handling of all the materials that go to make up the charge.

Boxes made of plates are placed on small cars and filled with the iron and steel at the stock pile. The cars with the loaded boxes are then run into the melting house in front of the furnace that is to be charged. The machine picks up the boxes, runs them into the furnace, dumps them and removes the empty boxes to the car, and so on until the whole charge is in. Very little description of this machine is necessary, as its general features are the same as those of the ingot charging machine.

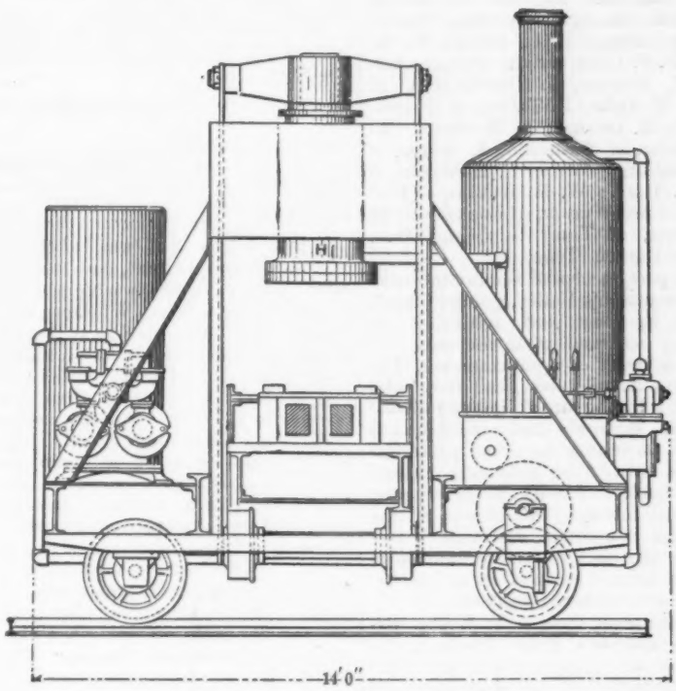

Fig. 4.—Front Elevation.

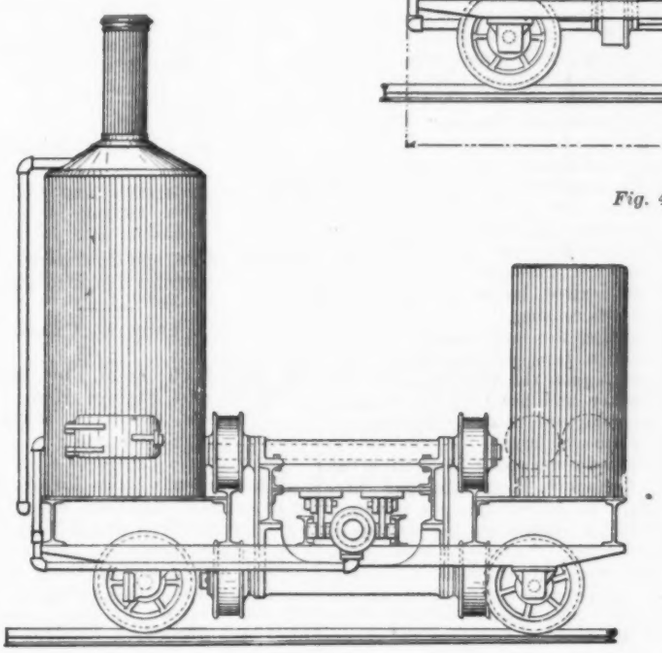

Fig. 6.—Rear Elevation.

C. E. Irwin, late secretary of the La Belle Iron Works, of Wheeling, W. Va., has gone to Beaver Canon, Idaho, to take charge of a gold mining property in which he and several other Wheeling capitalists are interested.

Negotiations looking to the acquisition of the Reading Railroad by the Vanderbilts are said to have reached a point depending only on the price to be paid. The Philadelphia *Inquirer* says the scheme must come to naught; that the Pennsylvania Railroad would never agree to see the Reading in the possession of the Vanderbilts. An attempt, it says, to add it to the great New York Central aggregation would precipitate a war of far greater bitterness than that which was patched up by the West Shore deal. The Vanderbilts would not allow the Pennsylvania to take the Reading, and neither the Baltimore and Ohio nor the Lehigh Valley would be permitted to take it. The Vanderbilts have some important traffic relations to preserve. The Reading gives the New York Central access to Philadelphia, gives it 750,000 tons of coal for shipment to Buffalo, and provides a market for 1,000,000 tons of Beech Creek coal a year. Should any large road secure the Reading this business would all disappear, and $16,000,000 of Vanderbilt money invested in the Beech Creek, Pine Creek and South Penn roads would be practically sunk.

A tunnel to Prince Edward Island, across Northumberland Straits, a distance of 6½ miles, the cost to be $17,000,000, is the next great engineering feet talked of in Canada. The Government is asked to guarantee the bonds.

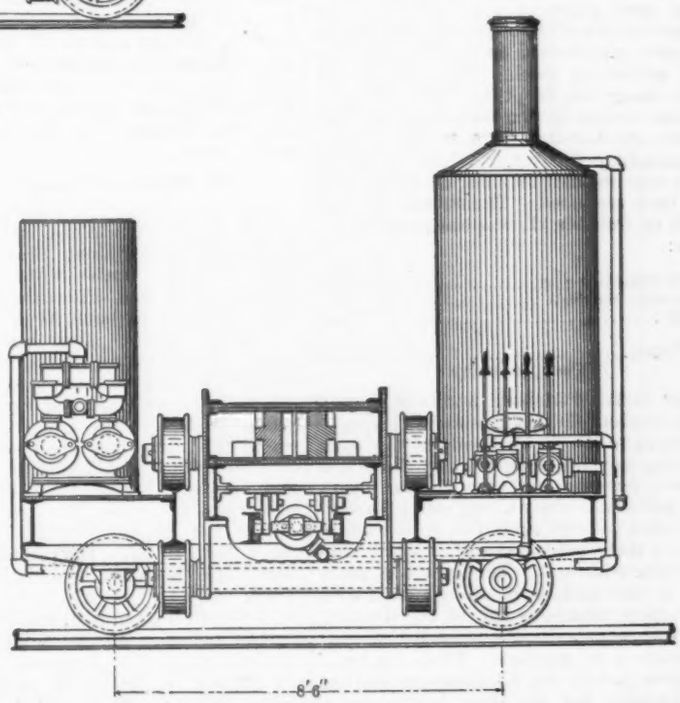

Fig. 5.—Vertical Cross Section on Line 5-5 of Fig. 1.

THE SOUTHERN TOUR.

A large number of the Chattanooga Reception Committee met the visitors on their arrival, among them being Newell Sanders, chairman; L. S. Colyar, W. M. Bowron, N. S. Chamberlain, Gustave Bidtel, J. M. Duncan, J. Dowling, S. B. Lowe, G. W. Ochs, B. Talbot, of Chattanooga; W. M. Duncan, A. M. Shook, W. T. McGruder, of Nashville; J. Lodge, of South Pittsburg; Walter C. Harriman, of Harriman, Tenn.; W. H. Mullins, of Fort Payne; Willard Warner, of Rockwood; E. O. Nathurst, of Tracy City, and Geo. Jamme, of Dayton, Tenn.

A small party accepted the invitation to visit the Sesquatchie Valley, going to South Pittsburg by boat and returning by rail. They returned with the most enthusiastic account of their excursion. The day was wonderfully clear, and those who went direct by the broad gauge railroad to Lookout Mountain had spread before them in all its beauty the grand panorama which has made that mountain famous. The great Lookout Inn had been reopened for the day through the efforts of the Chattanooga committee, and with a few exceptions the visitors were comfortably housed. Sunday was thus spent quietly under the most pleasant auspices.

In the afternoon Gen. J. T. Wilder delivered an address at Point Lookout, explanatory of the topography of the country and descriptive of the great events of which it was the scene. The evening passed with singing by ladies and gentlemen of the party, and by the Pullman Singing Society, organized by the Germans, who had held a number of rehearsals during the previous evenings. This was followed by an address by Gen eral Wilder, on the geology and resources of Tennessee and adjoining States, with the aid of a great map compiled for the Chattanooga Chamber of Commerce.

On Monday morning the greater number left the mountain on the Lookout Narrow Gauge and Incline to visit the Chattanooga Foundry and Pipe Works, which are chiefly remarkable for the casting pits with revolving tables. The next point reached was the plant of

The Southern Iron Company.

the principal attraction being the new basic steel plant of that concern. The plant consists of two 25-ton open hearth furnaces excellently built, of which one was producing steel. The casting pit runs along the length of the furnaces, bottom casting having been adopted. The ingots are handled by a traveling crane commanding the pit. While work has been experimental thus far, excellent steel has been produced. The charge, No. 20, made on October 17, was composed as follows:

	Pounds.
South Pittsburg pig	15,756
LaGrange charcoal	6,954
Scrap	12,500
Total	35,210

Yield, 30 ingots.

The South Pittsburg iron was part of a lot of about 600 tons, made with special reference to the requirements of the basic process, the aim being to carry the silicon below 1 per cent. and the sulphur below 0.80 per cent. Only a very small percentage failed to come up to this specification, while a large percentage of it came considerably within it. The iron was made with a coke made from washed coal, with the highly calcareous ore of the district, and with manganiferous hematite as constituents of the mixture. There can be no question that in the Chattanooga district pig suitable for the open hearth basic process can be produced at a reasonable cost. It was at first believed that charcoal iron would have to be depended on as the chief raw material, but that is now recognized as unnecessary. The scrap used seemed to be the ordinary mixed country scrap, available in fair quantity in any center of population.

The steel produced from the charge referred to in the above had the following analysis:

Analysis of Chattanooga Basic Steel.

	Per cent.
Carbon	0.06
Silicon	trace.
Manganese	0.43
Sulphur	0.021
Phosphorus	0.025

A true of this heat was, at the request of your correspondent, subjected to a series of tests, to which were added others suggested by Oliver Williams, of Catasauqua, Pa. The steel was forged to a square bar, quenched in water, nicked and bent double at the nick, without breaking or showing any more than a slight opening at the nick Another test was to heat, forge, allow cooling to dull red, nick around and double, which again revealed excellent quality. Finally, a bar was forged to a round, welded to form a link, quenched and flattened down under the hammer, without showing signs of distress. The flattened link was then opened up again under the hammer, when it displayed a fibrous structure. No data as to cost can be given as yet, since the work has been experimental thus far. That excellent steel can be produced is beyond a question. Uniformity and regularity of product is a matter of management. The company are now putting in a heavier engine for their blooming mill, and will noos be in a position to deliver billets. The old two 5-ton Bessemer plant might, should it be desired, be utilized for a preliminary desiliconizing.

After visiting the steel works the party embarked on a boat passing up the Tennessee River, past the new bridge to the Citico Furnace and the City Water Company's pumping and filtering station, returning to the city later.

The afternoon was spent in visiting the National Cemetery, Ridgedale, and Mission Ridge. In the morning an informal reception was tendered by the citizens at the rooms of the Chamber of Commerce, during the course of which R. S. Taylor, Governor of Tennessee, delivered an address. As train after train pulled out of the Union Depot, singing, speeches and cheers were the parting salutes of the guests to their Chattanooga entertainers who, however, were unable to understand clearly the words of good bye delivered in Welsh by Owen Morgan from the platform of section three.

At Middlesborough, Ky.

The early risers on Tuesday morning found themselves in the mountains of Kentucky, passing along the Cumberland River through Barbourville, famous in vendetta days, and Pineville, one of the many aspirants to fame, as coke and iron producing centers. They had the experience, too, of seeing streets being graded in a field without a house in sight. Then the trains rolled into the depot at Middlesborough, Ky., the creation of a year, where the party was received by the members of the Local Reception Committee composed of Alexander A. Arthur, chairman, John M. Brooks, the resident manager of the Middlesborough Town Company; John B. Cary, the president of the Manchester Building Association; Edgar Watts, director of the Watts Iron and Steel Syndicate, Limited, and F. J. Hoyle, general manager of the Middlesborough Belt Railroad. The Americans greeted as old friends O. W. Davis, of the Davis-Colby Roasting Kiln, and L. S. Reis, who is now general manager of the Watts Company.

Youthful Middlesborough's poetic editorial greeting, in flaming head lines, was somewhat novel:

THEY COME TO-DAY

FROM

FAR AWAY, ACROSS THE RAGING SEA,

To Pass Upon What We Have Done, and What We're Going to Be.

THREE SPECIAL TRAINS

of Men of Brains, will Enter Here To-day, to View the Store of Coal and Ore that Marks our Prosperous Way.

And again:

THEY TELL THE TALE

OF HILL AND DALE, IN LANGUAGE QUITE UNIQUE,

And of our Store of Wealth Galore in Strongest Terms They Speak.

THEY MARK THE FACT

That We Are Backed by Nature's Treasures Grand, and Prove our Claim to Wealth and Fame, a Structure That Must Stand.

And once more:

AN EXPERT TALKS

ABOUT THE WALKS AND OBSERVATIONS TRUE,

Of Iron Mine, and Coal so Fine Brought Forth for Them to View.

A SHOWING GRAND

Of this Rich Land, by Mr. Courtis Made, and Figures Here as Will Appear, to Prove What He Has Said.

Whatever may be its future, those who have created Middlesborough have certainly proven their own faith in it by lavish expenditure of money. Hills have been carried away, the tortuous stream has been provided with a new bed, which it is the aim to secure by sheet piling; streets have been graded, a handsome hotel has been built, a large number of residences and houses have sprung up, and a good many town lots have been sold, one-quarter cash down, the balance in one, two and three years. The amount of work done in the short space of 15 months is almost incredible. The credit is due to A. A. Arthur, who has been bravely backed by English capitalists. Whatever doubts and misgivings may arise in the minds of outsiders, they cannot help admiring the prodigious energy and pluck displayed. Whether the industries based upon the natural resources can bear the burdens of interest accounts which such expenditures involve may be questioned. That is the riddle which troubles the majority who calmly watch the peculiar phase into which Southern development has drifted.

Middlesborough's main reliance will be its coal, which produces a good coke. Thus far an experimental plant of three ovens has been erected, but the best results have not been obtained, the ovens being too cold. It is probable, too, that outcrop coal has been coked. It is hardly fair, therefore, to judge of the character of the coke to be produced from that already made, although its quality chemically is good. Its structure and physical qualities will prove better in actual practice than that exhibited by the product of the experimental ovens alluded to. The mineral lands

in the vicinity of Middlesborough are owned by the American Association, Limited, with a capital of $2,000,000, who lease the coal lands to independent operators at 10 cents a ton royalty. In the hills surrounding Middlesborough, particularly along Little Yellow Creek, there are above drainage level eight workable seams, varying from 22 to 72 inches, the latter one now being opened upon It has a 1½-inch parting. The coal has been tested by a number of entries. Some of the party visited the lower opening of the Mingo Mountain Coal and Coke Company, of which the following analyses have been made:

Moisture.....	1.95	2.15	1.95
Volatile matter....	39.10	38.30	40.95
Fixed carbon.....	55.50	59.95	55.15
Ash	3.45	1.60	1.95
Sulphur..	0.494	0.418	0.611

The veins are nearly horizontal, are readily accessible, and should be cheaply mined. At the Mingo Mountain 300 coke ovens are now in course of construction, along the Little Yellow Creek, where there is an ample water supply.

The leading plant at Middlesborough, so far as an approach to completion is concorned, is that of

The Watts Iron and Steel Company,

an English corporation, of which E. H. Watts, of London, is the president, Frank and Edgar Watts are the managing directors in America, and G. L. Reis, a well-known Pennsylvania ironmaster, until recently at Knoxville, is the general manager. The furnace plant consists of two 75 x 17 foot furnaces, supported by seven 20 x 60 feet Whitwell-Cowper-Cochrane stoves, three for each furnace, and one in reserve. The stock house which is 100 x 225 feet, occupies a position along the back of the plant, flanked by the two hoist towers, into which Otis elevators are to be put. Then follows the line of hot blast stoves, the bridge between the hoists and the furnaces passing between them. In line between the furnaces is to be erected a water tower 18 feet in diameter and 100 feet high, to be used jointly by the furnaces and the steel plant. The draft stack flanks the stoves, the flues being of very ample dimensions. The furnaces themselves are completed so far as the shells are concerned, the downcomers and dust catchers being located on the off side of each furnace from the center line. Of the seven stoves, six are now lined. The stoves have a central combustion chamber to avert the danger of having the back end of the stoves insufficiently hot. The furnaces will be lined to 9 and 10 feet hearth respectively. The bosh will be at a hight of 19 feet from the bottom. The diameter of the bell will be 10 feet. In front of the furnaces are two cast houses, 150 x 60 feet, and between them the intervening space is covered to form a third cast house of 50 x 150 feet. The furnaces, therefore, have an extraordinary cast house area, which will allow of handling the iron cold, and by the avoidance of night work will allow of lowering the cost. At the side of the plant lies the boiler house, with 24 34-inch boilers, 54 feet long, and two 18-inch flues, the majority of which are in place. The boiler house is flanked by the engine house, which is to contain six Witherow blowing engines, with 42-inch steam and 84-inch blowing cylinders and 5-foot stroke. The foundations of two of them were being built at the time of the visit. The engines will be equipped with the new Witherow valve, which has done such good work at the Crozer furnaces and elsewhere. The entire plant is being built in the most substantial manner, all the buildings being of iron. Its cost will probably reach $450,000. Were it not for the difficulty in completing the railroad connection to supply it with stock, it could blow in in February of next year. The plant is being built under contract by J. P. Witherow. The work of grading has been begun for the basic steel plant, to be erected in the immediate vicinity of the furnaces. It is to contain seven 25-ton Batho basic open hearth furnaces, to be supplied by 24 Wellman gas producers. The blooming mill is to be in a building 285 x 100 feet. Considering the fact that the first railroad entered Middlesborough on August 23, 1889, and that work on the plant was started in December of that year, wonderful progress has been made.

The Watts Iron and Steel Company have control of 3000 acres of mineral lands in the vicinity of Middlesborough, and confidence in its ability to furnish the ore needed is expressed. It is upon the ability to supply the iron ore from the deposits in its proximity that serious doubts have arisen in the minds of disinterested experts who have examined into the question. It is asserted, however, that supplies could be readily drawn from some distance to meet the coke, concerning the production of which cheaply at Middlesborough there can be no doubt whatever. We understand that a contract for three years' supply of coke for the Watts furnaces has been made at $2 per ton. It is asserted that the ore can be mined for $1 per ton. So far as the prospects of the Watts Iron and Steel Company is concerned, which is understood to comprise the best of the available lands, we have been given the following information: The principal deposit is a bed of iron ore ranging in thickness from 4½ to 6 feet, which consists of a lower bench of hard ore carrying 39.28 per cent. of iron, 12 per cent. of lime and 2½ per cent. of magnesia, and a 2-foot bench of soft ore with 49 to 51 per cent. of iron. Between them is a slate parting of about 5 inches. Thus far the company have opened 16 drafts and 2 slopes, driving in all 1½ miles of entry, and extracting therefrom about 2000 tons of ore. On the Poor Valley ridge, above the red fossil bed is a 19-inch vein of soft ore carrying 54.7 per cent. of iron and about 15 per cent. of silica. This can be obtained by stripping from 2 to 5 feet, over a considerable area. It is believed that a self-fluxing mixture can be obtained which will yield about 42 per cent. in the furnace.

Some of the party visited the Pinnacle, others the Cave, while a number inspected the manufacturing plants of Middlesborough. In the afternoon Prof. J. R. Procter, State Geologist of Kentucky, spoke on the geology and resources of the district in a somewhat sanguine manner. Sir James Kitson expressed the well wishes of the visitors in well chosen words, and the proceedings closed with a brief speech by A. A. Arthur.

A special train was in waiting at Pulaski, Va., Wednesday morning, to convey those who joined in the excursion to the famous

Gossan Lode.

Undaunted by rain, the majority departed, going first to Ivanhoe, 32 miles, and then to the mines proper, a distance of 48 miles from Pulaski. Among those who acted as guides were A. J. Dull and Andrew S. MacCreath, of Harrisburg, and E. C. Pechin, of Roanoke. The Gossan Lode is a depositt of pyrrhotite, which has been traced for a distance of about 16 miles. It is cut by Chestnut Creek and at its western end by Crooked Creek, so that there are ready facilities for attacking the deposit. Like the majority of pyrites beds, its outcrop is oxidized, and it is this part of the vein which has become the source of iron ore. The lode varies in dip from 30° to 50°, and in some points, particularly where its dip is gentle, it dips with the slope of the hill, being entirely exposed in some cases, while in others the amount of stripping to be done is light. The width of the lode, measuring vertically from wall to wall, varies from 20 to 175 feet, the latter figure being reached at the Great Outburst mine. Naturally, the oxidizing and teaching influences have extended to varying depth at different points along the lode. On the whole, the observation has been made that on the narrow portions of the belt the zone of decomposition extends to a depth of 50 feet, while it is shallower where the body is larger. The topography of the country has probably exerted considerable influence upon it. The normal depth of decomposition is said to be about 30 feet. The Gossan lode, therefore, represents a surface strip of great length in the lode, but shallow, so far as depth is concerned. In the aggregate the amount of ore in sight must be enormous, and the cost of mining, with open cut work exclusively and ready access for mining, must be low. It is estimated by excellent authority that the ore can be put in the cars from the larger bodies at 50 cents per ton. Where the dip is gentle and conforms to the slope of the hill the change into brown hematite of the "mundic" (pyrites) will have taken place deeper, both from the outcrop and along the slope of the bed, and *per contra*, where the bed dips steeply into the hillside, the covering along the dip or slope of the bed will have prevented any great amount of change, except along the outcrop. Again, where the creeks have cut through the deposit, the change will have taken place not only along the natural outcrop on top, but along the exposed edges of the bed as well, thus giving a good face of ore from near the water level up to the outcrop on top of hill, with, of course, the unaltered core of mundic following up the slope of the eroded hillside, having a top covering of gossan just as it has along the outcrop. The erosion caused by the streams cutting through the bed, while it has carried away a good deal of mundic, has more than compensated for this by allowing the mundic bed to be changed into gossan along the face of the hill down from the natural outcrop on top, and at the same time afforded natural avenues for branch railroads and for mining operations.

The ground has been very thoroughly opened and prospected, because in former years a good deal of mining and exploration was carried on for copper. It is only during the past 18 months, however, that the Gossan has attracted serious attention as the source of iron ore. The old workings for copper ore were most extensive at the western end, while at the eastern end the recent developments for iron ore have been more extensive. The decomposition at the outcrop seems to be very thorough. A drift in the Gossan, along the line of contact between the pyrrhotite and the iron ore, exposing both, showed by sampling that the iron ore was as low in sulphur in the immediate vicinity of the contact as at points nearer the surface.

So far as the character of the ore is concerned, it is practically free from manganese at the western end, running from 0.1 to 0.2 in manganese. At the extreme eastern part of the lode it runs up to 1 and 1½ per cent. Numerous analyses and the smelting of a considerable quantity at the Ivanhoe and Pulaski furnaces have shown the yield to be 46 per cent. of iron, which reaches 47.75 per cent. at the Great Outburst mine. The sulphur averages 0.2 per cent.; the copper, 0.36 per cent.; the phosphorus, 0.12 per cent.; the manganese, 0.2 per cent., and the silica, 15 per cent. Selected mundic carries 53 per cent. of iron and 33 to 35 per cent. of sulphur.

Starting at the east end the openings are, in their order in the lode: The Wilkinson, Great Outburst, Baumberger Outburst, Hervey and Howard. The princi-

pal deposits at the eastern end are owned by the Virginia Mining Company, of which A. J. Dull, of Harrisburg, Pa., is president. The success of this company has been phenomenal. Their capital stock of 13 shares is $130,000, of which $110,000 has been paid in. Transfers of the $10,000 shares have been made on the basis of $75,000 per share. Three Virginia furnace companies, among them the Pulaski, with two shares, own an interest in the property. Both ends of the lode have been made accessible by railroads built by the Norfolk and Western Railroad Company, the eastern end being tapped by the Reed Island branch, while the western end has been opened by the North Carolina extension, joining the Cape Fear and Yadkin Valley Railroad at Mount Airy. Preparations are now being carried forward to do mining on a large scale, the plans of the Virginia Mining Company contemplating an output of 500 tons a day. The ore has been, and is now being used at the Pulaski Furnace, entering into the mixture to the extent of one-quarter. We are informed that the best results have been obtained with one-half. The ore is open and spongy. The development of the Gossan lode is one of particular moment to the iron industry of Virginia at this juncture. It is conceded by those who have carefully considered the situation that furnace building has proceeded at a rate in excess of ore and coal developments. An ore famine is imminent in Virginia before next spring, and there are those who predict that next summer lake and foreign ores will be dumped in considerable quantity into the tunnel heads of Virginia stacks. Those who are the leaders in the Gossan lode mines state that it will be their policy to supply as much of the demand as they have facilities for. They sell alike to all furnaces, whether interested in the mining company or not, at the market price, which at the present is $1.70 and $1.80 per ton on the cars at mines.

The Illinois Steel Company.

Under the direction of the local Reception Committee, Geo. W. Cope compiled a book on the iron and steel interests of Chicago for the information of the Iron and Steel Institute and Verein Deutscher Eisenhuettenleute, on the occasion of their recent visit to that city. From that book we take the following description of the Illinois Steel Company, which is a corporation formed by the consolidation of the North Chicago Rolling Mill Company, the Joliet Steel Company and the Union Steel Company. The consolidation was effected May 1, 1889, and brought under one control and management five plants, as follows: North Chicago Works, South Chicago Works and Milwaukee Works, of the North Chicago Rolling Mill Company; Joliet Steel Company's Works, at Joliet; Union Steel Company's Works, at Chicago. Other property, such as coal lands and coke ovens, &c., belonging to the separate companies was also included, the whole comprising a property which is capitalized at $25,000,000. The five plants of the company occupy over 500 acres of ground, and the coal lands consist of 4500 acres, on which there are 1150 coke ovens.

The company own 1500 cars used in the coke trade, and the internal transportation at the different plants requires the use of 500 cars and 42 locomotives of standard gauge, besides 17 narrow gauge locomotives hauling special trucks. There are 60 miles of standard gauge and seven miles of narrow gauge railroad in the yards. The output of finished product for the year ending June 30, 1890, was as follows:

	Gross tons.
Rails	539,603
Rods	49,800
Bar iron and steel	56,415
Billets	29,295
Beams and channels	5,161
Total	680,274

During four months of this year the largest rail mill of the company was undergoing reconstruction, and did not contribute to the above product. The blast furnaces (14 in blast) produced during the same period the following:

	Gross tons.
Pig iron	614,240
Spiegel	32,777
Total	647,017

The Bessemer works (four plants), with a total of nine vessels, of capacities from 6 to 10 tons, produced:

	Gross tons.
Ingots	751,833

The product handled in and shipped from the various works was thus:

	Gross tons.
Pig iron and spiegel	647,017
Bessemer ingots	751,833
Rails	539,603
Billets	81,585
Rods	49,800
Bar iron and steel	56,415
Beams and channels	5,161
Total	2,131,414

In the manufacture of this product there was used in round numbers the following materials:

	Gross tons.
Iron ore	1,100,000
Coke	700,000
Coal	200,000
Total	2,000,000

About 10,000 men are employed in the mills of the company, and the pay rolls for the year ending June 30, 1890, amounted to about $6,000,000.

It will be noticed that by far the greater part of the product of the Illinois Steel Company is in the form of rails, and, in fact, until within a few years, it might be said that the only product of the several works now owned by the company took that form. All the works were originally built to make rails, and for many years the activity in that trade was such that no other product was thought of, but the increase in the demand for othor forms of steel has made it necessary to diversify the product, and the company now make billets, rods and beams, as well as miscellaneous bar iron and steel. A very large open hearth steel works and plate mill are under way, and a mill for rolling all classes of structural steel will be built in the near future. To provide for the increased output, and to make the company independent of outside sources for their supply of pig iron, four new blast furnaces of the largest size are being built and will shortly be blown in.

When the additions and improvements now under way are completed, the plant of the company will comprise the following:

	Annual capacity. Gross tons.
19 Blast furnaces	1,200,000
4 Bessemer works	1,100,000
1 Open-hearth works	75,000
4 Rail mills	850,000
2 Billet mills	100,000
1 Rod mill	60,000
1 Structural mill	80,000
1 Plate mill	60,000
1 Merchant mill	75,000
Total annual capacity	3,600,000

Three of the plants of the company are located within the corporate limits of the city of Chicago—the North Works, the South Works and the Union Works. One is at Milwaukee, Wis., 90 miles north of Chicago, and one is at Joliet, Ill., 40 miles southwest of Chicago. All the works are connected by telegraph and telephone service with the central office in Chicago and with each other. The following description of each of the plants is necessarily brief, and it will be understood that many details of possible technical interest are omitted.

North Works.—This is the oldest of the plants of the company, having been started in 1857 asa mill for rerolling iron rails. The manufacture of iron has long been discontinued, and the product at present is steel rails, beams and slabs. The plant is situated on the north branch of the Chicago River, in the northwestern part of the city of Chicago, and consists of two blast furnaces, 16 feet by 65 feet, one of which is making spiegel; a Bessemer plant, with two 6-ton vessels; a 30-inch three-high blooming mill, and a 23-inch three-high mill, which is used for rolling rails and beams. The furnaces were built in 1869, and were originally equipped with pipe stoves, which, within two years, have been replaced by fire brick stoves of the Gordon and Massick & Crookes type. Ore for these furnaces is brought by vessel and by rail from the Lake Superior mines, and delivered close to the furnaces. The product is chiefly Bessemer iron, but a good deal of spiegel is made from native and foreign ores. All the iron is run into pigs, as the Bessemer plant is not fitted to use direct metal.

The Bessemer plant was built in 1872 on the designs of A. L. Holley, and consists of two 6-ton vessels, five cupolas for remelting pig iron, three spiegel cupolas, a ladle crane, and three ingot cranes, all arranged on the Holley or American plan, two horizontal blowing engines, hydraulic pumps, &c. At the time of its construction this was the most completely equipped Bessemer works in America, and, for a plant of its relatively small size, has done remarkably good work. Very few changes have been made in the machinery and equipment, and it is now somewhat antiquated, but still capable of giving a good account of itself. Ingots (three rail) are heated in coal fired furnaces, bloomed and cut to single rail lengths, as the mill arrangements will not permit the rolling of longer lengths. The blooms are reheated in coal furnaces. The rail mill rolls the usual patterns of rails and beams up to 15 inches depth. Pieces are handled at the rail train with hooks and tongs in the old-fashioned way, and it may be noted that this is the only mill of the company where this is now done.

Some historical interest attaches to this works from the fact that in the old rail mill the first steel rails made in America were rolled May 24, 1865, from blooms made at the experimental Bessemer works, at Wyandotte, Mich.

South Works.—This, the largest of the company's works, is situated on the shore of Lake Michigan, 12 miles south from the center of the city of Chicago. The facilities for receipt and shipment of material, both by vessel and rail, are excellent. The largest steamers plying on the lakes bring ore to the docks, and three railroad lines come into the yard, furnishing connection with the entire railroad system of Chicago. The site of this plant was in 1880 a sand beach, barely above the level of the lake. In that year the erection of four blast furnaces was begun, and in 1881 ground was broken for the Bessemer and rail mills. The plant now in operation consists of four furnaces, 21 x 75 feet; a Bessemer plant with three 10-ton vessels; a 40-inch three-high blooming mill; a 27-inch three-high rail train, and all facilities for handling a large output of rails, which at present is the only product. Four more blast furnaces, 21 x 85 feet, are nearly ready to blow in; an open hearth steel plant and

plate mill are under way, and a new harbor, 200 feet wide by 2500 feet long, has been built for the accommodation of vessels bringing ore to the docks.

The four blast furnaces now at work, and furnishing about 800 tons of metal per day, have 12 Whitwell stoves, eight blowing engines, and an excellent equipment in every respect. The metal from them is used direct in the Bessemer works, to which it is conveyed in ladles up an inclined track. Ore for these furnaces is received almost entirely by water, and vessels are unloaded into an ore yard back of the furnaces, covering 300 x 1200 feet. The machinery for discharging vessels is exceptionally rapid in its operation, and vessels can be unloaded at the rate of 250 to 300 tons per hour.

The Bessemer works began operations in June, 1882. There are three 10-ton vessels working to one casting pit, three ladle cranes, four ingot cranes, two horizontal blowing engines, pressure pumps, &c. Four spiegel cupolas, and two iron cupolas for remelting pig, occupy separate houses on opposite sides of the converting building. The ladles with iron and spiegel pass in front of the vessels. A large building in the rear of the vessels is devoted to making bottoms, lining ladles, &c. The vessels are made with removable shells on Holley's plan, with a powerful hydraulic lift under each for handling the shells and changing bottoms. A new blowing engine and boilers are being added to this plant, the intention being to insure a large output. The largest 24 hours' work of this plant to date has been 1400 tons of ingots.

The steel is cast into ingots 16 inches square and making six rails each. The ingots are taken from the pit and conveyed in an upright position to the soaking pits (which are not Gjers' pits, but holes containing 8 or 10 ingots, fired with gas passing through regenerators), and after heating are taken to the blooming train. Here an ingot is reduced in nine passes to a bloom 8 inches square, which is cut into two blooms, each making three rails. Ordinarily these blooms are rolled direct to rails, but a furnace is provided for reheating any that are too cold to roll. The rail train is in two parts (each driven by a separate engine), placed parallel to each other and 80 feet apart. The bloom after roughing (five passes) in the first train goes to the second, in which it makes four passes and then returns to the first train, where it is finished to a rail in four passes. This train, which has just been started, replaces a 26-inch two-high reversing mill, put down in 1882, and the arrangement of the train in two parts was made necessary by the limitation of the size of the building in which the old train stood. The rail then passes to the saws and hotbed, and to a very complete finishing house, where it is straightened, drilled, inspected and loaded on cars.

The completion of the new furnaces, the open-hearth plant and the plate mill will make this works the largest establishment in the country. In anticipation of this the company have erected a fine office building and a laboratory which will be the largest and best of its kind.

Nearly all the ore for the supply of 15 furnaces will be unloaded at the docks of this plant, and a large part of it sent by rail to the Joliet and Union Works. To provide for this immense business, which must be done in seven months of the year, the new harbor and ore handling machinery have been put in, and it is expected that shortly 5000 tons of ore will be handled per day on the new dock.

An interesting detail of this plant is the use of crude petroleum for firing boilers. The oil is delivered to the works by a pipe connecting with the main pipe line from Lima, Ohio, 208 miles distant.

MILWAUKEE WORKS.—This plant is situated on the shore of Lake Michigan at Bay View, a suburb of Milwaukee, Wis., and occupies a very fine site, with ample room for extension. It is the only works of the Illinois Steel Company where manufactured iron is produced, the other plants being devoted to steel. It was built for a rail mill in 1868, and enlarged and adapted to merchant iron work in 1874 and 1884. The product is now miscellaneous bar iron and steel, fish plates, light rails and nails. There are two blast furnaces, 17 x 66 feet, built in 1870, and lately remodeled and equipped with fire-brick stoves. The product is mostly forge and foundry iron and some Bessemer iron. Ores are brought from the Lake Superior mines and from an interesting deposit at Iron Ridge in Wisconsin. This latter ore is a red oolite, with 55 per cent. iron and over 1 per cent. phosphorus, is cheaply mined and makes a pig very suitable for the basic Bessemer process. The mills are provided with eight trains of rolls, from 8-inch up to 22-inch in size, puddling and heating furnaces, both coal and gas fired, producers, &c., and machinery well adapted to the class of work turned out. There is a well appointed nail factory with 100 nail cutting machines. This plant will probably continue to produce manufactured iron, but the increase in the demand for steel products, now rolled from steel made at other plants, will soon necessitate the erection of a steel works to make basic ingots.

UNION WORKS.—This plant is located in the southwestern part of the city of Chicago, on the south branch of the river. Originally built as an iron rail mill in 1863, a Bessemer plant was afterward added in which, on July 26, 1871, the first Bessemer steel produced in Chicago was made. Blast furnaces were later erected, as also plate and bar mills, a rod mill and a wire drawing plant. In 1884 the property came into the hands of the Union Steel Company, and was thoroughly remodeled, a large part of the machinery and buildings being removed and replaced by modern appliances. The product at present is entirely rails. There are four blast furnaces, two 14 x 72 feet and two 16 x 75 feet, supplied with an excellent equipment and doing very good work. The metal is run into pigs, as the Bessemer works does not use direct metal.

In the Bessemer plant there are two 10-ton vessels working to one pit, five iron cupolas, four spiegel cupolas, two ladle cranes, four ingot cranes, three blowing engines, the necessary hydraulic pumps, &c. This plant made its first blow May 31, 1886, and enjoys the distinction of having made the largest product with two vessels of any plant in America. During the year ending the 30th of June last 318,000 tons of ingots were turned out; the largest month's output was 36,200 tons, and the largest 24 hours' output was 1639 tons. Ingots 15 inches square are cast, making four rails each, and are heated in soaking pits fired with gas, and rolled in a 36-inch three-high blooming mill to blooms 7¼ inches square and cut to two-rail lengths. These are then rolled without reheating in a 25-inch three-high train, provided with tables for handling the rails at the rolls. This train is driven by one engine and has rolled 1312 tons of rails in 24 hours, 28,490 tons in a month, and 260,000 tons in the year ending June 30, 1890. A separate finishing house provides ample facilities for handling and shipping a large product. Rails from 50 to 90 pounds per yard are rolled in this mill.

The steam fuel used at this plant is crude petroleum, which is delivered in tank cars and pumped to the several departments. The railroad connections to the Union Works are ample, but the yards are somewhat crowded, owing to the situation in a thickly built part of the city. Ore was formerly received by vessels, but now comes by rail from the South Works, where it can be more cheaply and quickly handled.

JOLIET WORKS.—This works was started as an iron rail mill in 1870, and a Bessemer works andsteel rail mill on Holley's designs were added in 1873. Two blast furnaces were built in 1873, the Bessemer and rail mill were remodeled in 1885, a Garrett rod mill was put down in 1888, and a third blast furnace was completed in 1890. The product is now rails, billets and rods. Although ores for this plant have to be transported by rail from Chicago or the mines, there is yet a considerable advantage in the location of the works, and one which determined the original installation —namely, the ample and cheap supply of coal for steam and heating purposes, which is obtained from the Illinois coal fields, at no great distance from the works. The railroad connections are very good. The blast furnaces are 20 x 80 feet, and are furnished with fire brick stoves of the Gordon, Cowper and Massick & Crookes type. Their product is Bessemer metal exclusively, which is used direct in the Bessemer works, to which it is conveyed in ladles, up an incline, crossing two main lines of railroad by an overhead bridge.

The Bessemer plant contains two 8-ton vessels, cupolas for remelting pig to supplement the direct metal from furnaces, spiegel cupolas, hydraulic cranes, blowing engines, &c., all of good and modern types. A great deal of special low carbon steel is made for billets, &c., besides the usual rail steel.

The rail mill comprises gas and coal fired furnaces, a 36-inch three-high blooming train, and a 24-inch rail train in two parts, each driven by a separate engine. The rail train is fed by an ingenious arrangement of troughs and tables, which is also used in the rolling of billets, which are made in the same train. After leaving the train the billets are cut to length by a hydraulic shear which works with great rapidity, and dropped upon a conveyor consisting of a chain of rollers kept in motion by an engine. The billets thus travel at twice the speed of the rollers, and are carried several hundred yards to the rod mill, where they are automatically dumped in piles. Some 350 tons of 4-inch billets have been rolled and conveyed in 12 hours.

The rod mill is of the most modern Garrett type, and is turning out a large product, over 5000 tons of No. 5 rod having been rolled in a single month. There are two engines driving the sections of the train, and the mechanical details, including the reels, are of the first class.

Very complete offices are accommodated in a handsome building of the limestone for which Joliet is famous, and an interesting and uncommon feature is the Athenæum, a very completely appointed club house and library for the accommodation of employees. This institution was built by the Joliet Steel Company before the consolidation, and affords to every employee, at a merely nominal charge, the advantages and conveniences of a first-class library and club.

The Emery Wheel Company, of Bridgeport, Conn., are gradually coming out of their recent embarrassment. Work has been resumed at the factory, and it is understood that the committee appointed to investigate the affairs of the company will make a proposition to the creditors at an early date that will allow the company to get on their feet again.

The Taunton Locomotive Works, at Taunton, Mass., are working nights to fill special orders on which the time for delivery is limited.

Perkins Brothers, Bridgewater, Mass., have completed and started their wire mill with 100 tons capacity per month.

THE WEEK.

The Director of the Mint, who recently visited a number of mining camps, says the silver product is increasing, there being great activity at all points.

The vault of the Union Trust Company's elegant new building, No. 80 Broadway, New York, is among the largest in the world. It is built in the shape of an independent tower, and is constructed wholly of steel. The vault proper is three stories in hight, supported on a number of steel columns, which constitute a subvault, set apart for the storage of silver bullion. The principal story of the vault is 25 x 27 feet, and the upper story, which opens into the banking room and is assigned to the use of the secretary of the company, measures 15 x 27 feet. The lower stories are surrounded by three separate lines of steel grills, and the entire vault is further protected by improved electric devices, time indicators and the like, and is guarded at all hours by a special force of watchmen.

A coast line of railway from San Francisco to Los Angeles is to be finished in 17 months

Six young naval officers will go abroad under orders from the Secretary of the Navy for a course of special instruction in naval architecture, preparatory to appointment as assistant naval constructors.

A large meeting of business men in Boston was held last week to advocate the construction of an independent direct line of railway to New York, claiming that the existing facilities are overtaxed.

The Canada Southern Railroad is experimenting with a compound engine, of which Vice-President Cox says they get 25 per cent. more work and which burns 25 per cent. less fuel. Two water "scoops" are being put down, which, with the compound engines, would make it possible to cover the 250 miles from Suspension Bridge to Windsor without a stop.

A French woolen mill is about to be established not far from New York, which will cost $2,000,000.

An English wire worker, now an American, has invented a torpedo net, constructed of steel rings which interlock. It will soon be practically tested.

The Brooklyn tax rate for 1890, as compared with 1889, is $4 per $1000 lower than the lowest since 1882.

A number of large sugar refineries have been closed to reopen April 1, when raw sugar will be admitted free. The Louisiana sugar crop will be 50,000 tons in excess of last year's, but Europe's beet product, according to the estimate of Mr. Licht, will be increased only 58,000 tons, which is insignificant in consideration of the small supplies left over from the large crop of last year.

Gloversville and Johnstown, Fulton County, N. Y., are expecting a large expansion of the glove industry.

The Morocco Manufacturers' National Association are reported to have resolved to employ no more Knights.

The acting Italian Consul in New York says the number of Italians in this city and Brooklyn is 70,000.

The Minnesota Car Works, just started at Duluth, have closed a contract with a large railroad corporation to build 1000 cars, a contract that calls for the expenditure of over $500,000.

An Ottawa dispatch says a combination exists between the glass manufacturers of the United States and those of Germany. Agents in Canada of the German manufacturers have recently taken orders for supplying between 30 and 40 tons of plate glass for the Western States, but the German firms decline to ship goods unless the assurance is given them that the duty be paid in Canada before the glass is sent forward to its destination in the United States.

Engineer Lindenthal is in consultation with the stockholders of the New York Terminal Company with reference to the great bridge across the Hudson River, which he is confident will be built.

Immigration into the United States in September amounted to 45,478, as compared with 38,517 for the corresponding month last year. For nine months the total is 381,400, an increase of 42,000.

A meeting of importers in this city is being arranged to test the validity of the tariff law. The special point raised is the omission from the draft of the bill which received the President's signature of a section included in the bill as finally passed by the House and Senate. The point raised is that on account of a section omitted, the bill signed by the President was not passed by Congress, and the bill passed by Congress has not received the President's signature.

The Immigration Commissioners offered Castle Garden to New York City as a part of the public park system.

Cornell University trusteees will erect a new agricultural hall.

Two new boats, the Whitehall and Montauk, both built at Newburg and identical in size, are nearly ready for service on the Hamilton Ferry. The vessels are of iron and are 190 feet in length. The engines are from the Quintard Iron Works

A ship canal through Pennsylvania to Lake Erie is pronounced feasible by the State Commissioner. The work would cost at least $25,000,000.

Certain newspapers derive a sort of grim satisfaction by affirming that the San Jacinto tin mines in California and the Black Hill properties in Dakota have alike passed into the control of English capitalists.

The Hebrew charities report cash receipts for the year $104,500, including about $17,000 trom the Baron Hirsch fund. The number of Hebrew immigrants who arrived at this port was 32,328, 25,000 of whom remained in New York.

The Liverpool Shipping Federation propose to tie up their ships, as a last resort, if needful to thwart the non-unionist dock laborers in their designs.

The exports of Philadelphia this year amount to $28,400,000, as compared with $21,900,000 for the corresponding period in 1889, and imports increased nearly $4,000,000 during the same time.

Nebraska in the last ten years has made a remarkable progress in population in comparison with the twin State of Kansas. The population of Kansas has increased from 996,096 in 1880 to 1,423,485. Nebraska, on the other hand, has increased in population in the same time from 452,505 to 1,056,793.

Sixty acres on the lake front at Chicago will be filled in for some of the World's Fair buildings at a cost of $700,000.

The Delaware and Hudson Railroad will double their line between Albany and Whitehall.

Inspector-General Dumont, of the Steamboat Inspection Service, says in his annual report that no mode of travel at the present day, whether by railway, horse car, carriage, or even the common farm wagon, presents so low a percentage of accidents as the travel by steam vessels.

The express companies have advanced rates 25 per cent. in all directions.

The works of the Davis-Chambers Lead Company, in Pittsburgh, were damaged by fire to the extent of about $15,000.

The American mails were delivered in London on the morning of the seventh day from New York.

The discovery of natural gas in Alabama, near Florence, opens better prospects for our iron industries.

The New York Central's freight yards at Thirtieth street, on the North River, have been improved by the erection of capacious fire proof sheds, divided by metal covered doors, and a big storage warehouse will be built. It is estimated that the improvements will cost $200,000.

Master Mechanic Henney, of the New York, New Haven and Hartford Railroad, is abolishing the old style of smoke stack on engines, and substituting simply an iron pipe without a rim at the top, which he claims caused a vacuum and injured the draft.

James A. Chambers, of Pittsburgh, was elected president of the Window Glass Manufacturers' Association.

About 600,000,000 feet of timber in Minnesota, acquired by the Northern Pacific Railroad in its land grant, have been sold to a syndicate for $1,000,000, for conversion into lumber, on the line of the road.

Plans for a tunnel under the Detroit River, with the design of shortening time between New York and Chicago, are in the hands of engineers. The work is in the Vanderbilt interest and will cost $3,000,000.

The United States will be poorly represented at the Jamaica exhibition, while Canada will occupy the largest space. British Columbia and the maritime provinces will show fish and minerals; Manitoba and the Northwestern provinces, grain, minerals and general produce; Ontario, fruits, manufactured goods and grain.

The New York representatives of the Consolidated Ice Machine Company, at Chicago, which recently made an assignment, believe that the difficulty will be arranged. The business done during the year amounts to nearly $1,500,000, and of the orders received the larger part are nearing execution.

Salt Lake City is booming. The assessed valuation for 1890 foots up $54,000,000. Buildings to the value of no less than $7,000,000 were added during the last twelve months. The hotel Knutsford, now in progress, will cost $800,000.

Contemplated improvements in Tacoma for the coming year will involve an expenditure of $5,000,000. Included is a new city hall, the first two stories of stone.

In every form of commercial, manufacturing, agricultural and mining development the new State of Washington shows a healthful activity.

A contract for a new iron ferry boat for the Pennsylvania Railroad Company has been awarded to Samuel L Moore, Sons & Co., of Elizabethport, N. J.

Architect Clark, of the Capitol, at Washington, is in receipt of a curiosity in the way of an engineering plan looking to no less a feat than the turning around of the great marble building where Congress sits. Some wonderful jacks will be placed at short intervals under the building after sufficient excavations have been made. Then the ground will be dug from around the foundation by degrees and shored up with iron girders from end to end, Under the central position where the

crypts now are he will place a circular railway, supported by more of these jacks, and upon these, with a pressure of only a few horse-power, he proposes to turn the entire Capitol without disturbing either its foundation or its walls.

Huge gay umbrellas to the extent of many tons are sent out yearly from Brussels to the Congo State for the use of the small African potentates, being considered emblems of royalty.

Sir John Pender, of submarine cable fame, writes that next year he will visit Canada, and be prepared to discuss the subject of telegraphic communication with Australia from the Pacific Coast.

The Grand Jury in Binghampton, N.Y., on the 23d inst., found nine indictments against employees of the *Leader* for criminal contempt of court in disregarding an injunction issued by Judge Forbes, which prohibited all persons from unlawfully encouraging the cigar makers' strike.

MANUFACTURING.

Iron and Steel.

The Liggett Spring and Axle Company, of Pittsburgh, have recently been granted a charter. The following are the directors: William G. Park, Jacob B. Decker, of Allegheny, Pa., and Charles E. Clapp and George Wright, Jr., of Pittsburgh.

The Pittsburgh Metallurgy Company, of Pittsburgh, have just put in one of M. V. Smith's fuel gas plants at the La Belle Iron Works, at Wheeling, W. Va. The company formerly used natural gas as fuel, but the supply became so irregular that they were compelled to abandon it.

Alice Furnace, at Sharpsville, Pa., operated by the Wheeler Furnace Company, of Sharon, Pa., is making a good record at present. In one day recently it produced 135 tons of Bessemer pig iron, and on another day it turned out 137 tons. As the furnace in question is only 12 feet in diameter and 60 feet high, it can be said to be doing good work.

A proposition has been made to the Omaha Board of Trade, of Omaha, Neb., by A. J. Sweeney & Son, machinery builders, of Wheeling, W. Va., looking to the starting and operating of a wire nail plant in Omaha. The firm propose to invest a large sum of money in the enterprise and operate the plant successfully for five years under certain conditions. They propose to lay out a plot of 240 lots, for which they will ask the Omaha Board of Trade to find purchasers. As soon as these lots have been sold they will commence work on the plant, which, it is claimed, will pay out about $100,000 per annum and employ about 100 men. Their proposition is now under consideration.

It is reported that a company has been organized at Radford, Va., for the purpose of manufacturing iron pipe and conducting a general foundry business as well. The company starts off with an actual cash capital of $300,000, and proposes to commence at once the construction of a plant, which, when completed, will be capable of consuming 100 tons of iron per day and employing 300 men. The following is a list of the officers of the company: President, James N. Gamble; vice-president, W. C. DeArmond; secretary and treasurer, Archer Brown; general manager, J. K. Dimmick.

Last week notice was given by the Philadelphia Company, the largest producers of natural gas in Pittsburgh, to a number of iron manufacturers in that city, that the supply of natural gas for operating the puddling furnaces will be discontinued. The notice went into effect on Tuesday of the present week. It is probable that other manufacturers will be served with similar notices in a short time. The reason given by the officials of the company for this action is that the company can derive more revenue from private consumers, and not because the supply of natural gas is decreasing. It is claimed that the demand for natural gas for house heating purposes is increasing very rapidly, and as a consequence this demand will be met by cutting off the supply from the iron and steel plants, where such large quantities are consumed. The rate charged for a puddling furnace is $2 per net ton on the amount of muck bar turned out in each furnace. The claim is made that this rate pays the company but 5 cents per 1000 cubic feet of gas, against 10 cents per 1000 feet paid by private consumers. On account of the great quantity of gas burned in each furnace, it is impossible to measure it, as there are no meters large enough. The firms that have been notified that the gas supplying their puddling furnaces will be shut off will have to return to the use of coal.

At Pittsburgh, last week, James H. Lindsay filed his report as appraiser of the interest owned by Capt. R. C. Gray in the firm of Park, Brother & Co., Limited, proprietors of the Black Diamond Steel Works, in that city, at the time of his death in May, 1888. The executors of Captain Gray's will are members of the firm, and as they were desirous of purchasing the interest of the deceased, Mr. Lindsay was appointed by the court to fix the value. The report shows that the capital stock of the partnership was $2,000,000, divided into 4000 shares at $500 per share. Captain Gray at the time of his death owned 829 shares of the stock and was also interested in other assets of the firm. The appraiser finds that in May, 1888, the stock was worth $568.23 per share, a total for the 829 shares of $471,065.98. There was also due him on special loan $81,178.12, and $6935.40 on other accounts, making his total interest $559,179.50. Allowing him for his pro rata proportion of the earnings from then until September 1, 1890, his interest at the latter date would be $634,948.32. The appraiser recommended that this price be fixed and sold to the firm for cash, payable 90 days after delivery.

No. 1 stack of the Woodstock Iron Company, Anniston, Ala., has gone into blast after an idleness of several months, during which extensive repairs were made and a large stock of charcoal laid in.

The furnace now building by the Brier Hill Iron and Steel Company, at Youngstown, Ohio, is expected to produce from 240 to 250 tons per day, which will make it among the largest furnaces in that section. Grace Furnace, of the same company, is now averaging 200 tons a day. The new stack will be known as Grace No. 2, and will be completed and in operation in about 30 days.

The rolling mill of the Muskegon (Mich.) Iron and Steel Company started up on the 21st, and is now being run to its full capacity.

The report that Mr. Jackson, of the firm of H. S. Jackson & Co., of Nashville, Tenn., is to become interested in the management of the Southern Supply and Equipment Company, of Atlanta, Ga., has led to the erroneous impression that that firm intended to discontinue their present office and the iron and steel commission and brokerage business which they are there conducting. We are informed that there will be no change whatever in the present office or business.

Machinery.

James P. Witherow, engineer and contractor, of Pittsburgh, has recently placed on the market an improved blowing engine for blast furnaces. Three of these have just been completed at the shops of Mr. Witherow, at New Castle, Pa., and were shipped to the South last week. A number of others are in course of construction.

On the 23d inst. a test was made at the shops of J. H. Cole & Son, at Parkersburg, W. Va., of a new nail machine, and the results are claimed to have been very satisfactory. The machine clips three nails at a revolution, and its owners claim that one-third more nails can be made by it in ten hours than by any other machine. A company is being organized at the above place to manufacture wire nails and also the machines.

The Jenks Machine Company, of Sherbrooke, Canada, have taken orders to the amount of $50,000 for mining machinery, to be set up in Sudbury.

The Lockwood Mfg. Company, East Boston, Mass., who occupy a three-story building 185 x 700, have recently put in a lot of machinery specially designed for heavy work. They are also building a new wharf and generally improving their property along the water front. They advise us that the plant is running to its full capacity.

A company, with a paid-up capital of $200,000, has been formed for the purpose of erecting a plant at Pell City, Ala., for the manufacture of all kinds of iron pipe and plumbing fixtures.

The Interocean Boiler Company, capitalized at $100,000, have filed articles of incorporation at Duluth, Minn. The company will manufacture the Hazleton boilers.

The James P. Montgomery Balance Pump Mfg. Company have organized, with a capital stock of $100,000, to do business at Pueblo, Col.

The City of Pueblo, Col., is reported to have offered the Santa Fé Railroad Company a bonus of $150,000 to remove their shops from La Junta to that city.

The Taunton, Mass., Copper Company have laid the foundation for a new 80 x 70 foot wire mill.

Hardware.

The Rogers Fence Company, Springfield, Ohio, have recently added wrought iron and steel bridges to their line of manufactured architectural iron work and bridge building, and will soon issue a new catalogue embracing these additions. They also issue illustration and price list of their Splendid lawn mower for 1891.

The Syracuse Chilled Plow Company, Syracuse, N. Y., send us catalogue and price list of their goods. Their growing trade has made it necessary for them during the past summer to considerably increase their facilities, both by the purchase of additional machinery and the addition of about 2 acres of floor surface to their plant. They advise us that they are constantly adding new implements to their line.

The Western File Company, Beaver Falls, Pa., have just completed repairs and repainting of their works, and refer to them as being the cleanest works of the kind to their knowledge, in the country. They have in preparation a new illustrated list, which will be issued in the course of 60 or 90 days.

Wells Bros. & Co., Greenfield, Mass., in a notice to the trade, state that their new factory being completed they expect during the month of October to get all their tools, machinery and stock moved into their new quarters. They hope, after getting settled in their new shops, with added facilities, to be even more prompt than they have been in filling orders intrusted to their care.

P. & F. Corbin, New Britain, Conn., are erecting an addition to their plant something over 150 feet long by 45 feet wide, six stories high. This building is intended for general use in their manufacturing business.

The Wilkinson Mfg. Company, successors to the Winton Mfg. Company, Binghamton, N. Y., are having a good trade on their children's sleighs, express wagons, velocipedes and ladies' folding tables. Their factory is especially large and well equipped for the manufacture of this line of goods.

The Rochester Machine Screw Company, Rochester, N. Y., are erecting an addition to their factory, which is to be completed in November, and in which they expect to be before January 1, 1891. The building will be of brick, four stories high, including in this number the basement. The first two stories are to be 14 feet between joists and the upper stories 12 feet. The main building will extend 112 feet along Caledonia avenue, with a depth of 50 feet for 50 feet of its length and a depth of 100 feet for the remainder. There will be an arched entrance to the office, with a covered driveway at the north end of the block. The driveway will lead to the shipping doors and elevator, and will then run down an incline into the court and to the rear of the basement. The whole building is to be well lighted, as the openings for the windows will take as much of the space in the sides of the wall as the brickwork. The building, fully equipped, will cost about $25,000. In the 20 years' existence of this company there has been no change in their officers, who are their sole stockholders.

The Selle Gear Company, Akron, Ohio, have outgrown the factory built three years ago, and have accordingly broken ground for a 40 x 60 one story brick addition to their blacksmith shop. The company advise us that they have been crowded in this department for the last ten months, and are crowded still in what is commonly known as the dull season. They have also decided to double their capacity in order to be in shape for the busy season, which opens up in February.

The Chattanooga Paint Company, Chattanooga, Tenn., in order to meet the demand for their goods have been obliged to run their works night and day during the entire year without any chance for repairs. They will, however, shut down about December 1 for a month or six weeks for general and thorough repairs and also to increase their capacity. It is therefore suggested that customers requiring their goods during December and January will facilitate matters by sending in their orders at once.

Miscellaneous.

Manganese bronze propellers will soon be made by a new Philadelphia firm organized by Thomas Mason. At present B. H. Cramp & Co., of Philadelphia, are the sole makers of this type of blade.

The Vermont Farm Machine Company, Bellows Falls, Vt., have lately begun the manufacture of the Ætna water heater for watering troughs and the Ætna radiator for warming root cellars, hen houses, &c. Several improvements have been made on the Bellows Falls evaporator for this season. New patents

have been granted during the last three months on the Cooley creamer. The sale of their fruit driers extend to the West Indies, Australasia and South America. They report large sales on the Davis swing churn for the past year.

A meeting of the creditors of the Harrisburg Car Mfg. Company was held at Harrisburg, Pa., on the 15th inst., and a statement of the financial condition of the concern was presented by the general manager, William T. Hildrup. About 60 creditors were present, representing 90 per cent. of the company's indebtedness, and the sentiment of all was for granting an extension of time of from one to three years, if needed. The following committee was appointed to act with the management for the interest of the creditors: John Wister, Duncannon; George K. Reed, Lancaster; W. W. Card, Pittsburgh; Spencer C. Gilbert and Gilbert McCauley, of Harrisburg.

The introduction of mining machines in the mines of the Pittsburgh district is giving miners considerable concern. It is claimed that each machine in practice expels from five to eight miners, and they begin to estimate the inroads the machine will make upon their numbers. They find that where 20,000 or 30'000 miners are in demand along the river mines to produce the coal required by operators, that this number may be reduced to 10,000 or less if machines are generally put in practice. As a result of this estimate, the miners contemplate a crusade against the machine. This augurs a conflict between the operators and the men, but a first pool operator said that if they decided to use the machines the men may as well not combat the decision. Miners have been scarce for more than a year, and this fact is largely responsible for the talk in favor of machines.

The Blue Ridge Manganese Company have been chartered for the purpose of buying and selling, owning and operating mineral lands and mines and conducting a general merchandizing business on that line. The principal office of the company will be at Charleston, W. Va., and the incorporators are: W. A. Wilson, Geo. O. Chilton, J. E. Chilton and W. E. Chilton, of Charleston, and L. A. Wilson, of Point Pleasant. The company have options on a large body of mineral lands in the Blue Ridge Mountains which is rich in iron, coal and manganese.

The Crozier Coal and Coke Company, operating in the Flat Top, W. Va., field, have contracted for a number of new houses preparatory to increasing their force of miners.

A company, to be known as the Manufacturers' Aid Association, is being formed at Baltimore, Md., for the promotion of manufacturing industries in that city. The concern will start with a capital of $2,000,000, which is to be increased to $5,000,000 should the demands of trade warrant it.

Advices from Columbus, Ohio, under date of October 14, state that an important decision has been rendered by Probate Judge Saffin. By the decision about $1,500,000 worth of real estate in the Hocking Valley region was ordered sold for the benefit of the creditors of the Ohio and Western Coal and Iron Company, which failed in February, 1889. Since the failure Hon. James A. Hall has been acting as assignee, and has effected leases and done other business for the creditors. W. D. Lee, of Newark, Ohio, who wanted the deed of assignment set aside resisted the order of sale. It is probable that the case will go to the Supreme Court for final decision.

The Wright & Colton Wire Cloth Company, of Worcester, Mass., have been unusually busy this fall in manufacturing locomotive spark netting and wire lathing, wire cloth, &c., having been obliged to run nights much of the time in some departments. They are now preparing to put a double turn of hands on in their poultry netting department, and are now engaged in doubling the capacity of their galvanizing plant by erecting new buildings and putting in new machinery and apparatus for galvanizing poultry netting and fencing. Their process for galvanizing these goods has been so perfected that newly galvanized goods present a smoothness and luster like that of polished silver.

The Inman Line, running between New York and Liverpool, have had the Magnolia anti-friction metal in use in the bearings of their steamships for about three years. James S. Doran, the superintending engineer, states that in some instances the service was "the hardest that I have ever seen anti-friction metal put to, and am free to say that it has given entire satisfaction."

The D. M. Steward Mfg. Company, Chattanooga, Tenn., manufacturers of electric insulators, lava gas tips, slate pencils, crayons, &c., make soapstone pencils, which are referred to as being very popular with various classes of mechanics, especially boiler makers, blacksmiths, &c. Particular attention is called to their patent lava electric insulators, which are described as not only perfect insulators, but in addition are thoroughly fire-proof, so that high tension circuits can be attached to them with safety. A number of single orders have been received for 200,000 pieces, the leading electric concerns being their best customers.

Chas. A. Schieren & Co., New York, manufacture the patent joint American leather link belt, which is adapted to driving dynamos, motors and generators for railroad work. They state that a link belt on a dynamo, when tight side is on bottom, secures to the user an easy, slack running belt, saving all heating by reason of strained bearings, the use of less oil, and at all times an endless true running belt. This company have recently received from the Louisiana Electric Light Company, New Orleans, La., an order for 160 feet 72-inch double leather belt and 550 feet 48-inch belt of the same kind. They allude to this 72-inch as the largest and heaviest leather belt in the world.

Randolph & Clowes, of Waterbury, Conn., manufacturers of seamless drawn brass and copper tubing, &c., are now building some new machinery for producing ornamental tubing of very novel patterns. They have recently moved their brazed tubing business into very much larger quarters than before occupied, and have thereby increased very largely their facilities in that line.

NEW ENGLAND ITEMS.

A new three story foundry is to be erected at the shafting works of G. V. Cresson, in Haverhill, Mass. The new plant will be 150 x 70 feet, three stories high, and is to be built as an addition of Mr. Cresson's present foundry, and will be similar to it in construction.

The Upson Nut Company, of Unionville, Conn., are putting in an electric light plant to furnish light for all their buildings. The work is being done by the Edison Company.

The Putnan, Conn., Light and Power Company have raised the sides of their brick building, and are to put on an iron roof.

Frederick C. Chase will, it is stated, organize a sub-company of the Safety Electric Light Company, of Boston, Mass., with a capital stock of $100,000, to operate in Fernandina, Fla.

The Knowles Steam Pump Works, at Warren, Mass., are building a new blacksmith shop.

The George Lawley & Son Corporation, as it soon will be known at South Boston, will shortly begin the work of fitting up an extensive plant for the building of steel, composite and all kinds of yachts, besides shipbuilding. The most modern tools will be used in the works, and in a few months at City Point there will be established one of the largest shipbuilding yards in the East.

The boom that has struck Chicopee Falls will be of great help to that village. The output of wheels from the Overman Works will be about doubled when the new shop is finished. The Lamb Knitting Machine Company will have to make considerable improvements on their plant to care for the large contract they have just signed. The Stevens Arms Company have contemplated enlarging their shop for an increase of business next season and the changes have already been begun.

Prof. Elihu Thomson has recently devised a process for case-hardening iron or steel by means of the heat produced by the passage of an electric current. His process consists essentially in heating the object electrically and then applying to the metal so heated a surrounding envelope—either gaseous, fluid or solid.

An important addition to the industrial interests of Lewiston, Maine, will be the new three-story power factory which the Union Water Power Company are now completing. The building is 60 x 40 feet. Part of it has already been rented by small manufacturing concerns. In addition to putting up the power shop they have had to build a small building for Skinner's bobbin shop. The building for the bobbin shop was some 30 x 54 feet in dimensions. The power shop is supplied with one 45-inch Hercules wheel of 450 horse-power; and also one 36-inch Hercules wheel of 175 horse-power. The machine plant was furnished by the Holyoke Machine Company, who also provided the plans.

The Lane Mfg. Company, at Montpelier, Vt., have put into their new machine shop a 10,000 pound radial drill, and have moved their old pattern house to another site, where a new foundation is being built for the same.

The Mason Machine Works, of Taunton, Mass., are now enaged in turning out specimens of new American cards which were recently put on trial in that vicinity and proved far superior to the heavier English cards now in use in mills of this country. A Providence, R. I., firm controls the new patent, and the Mason Machine Works have secured the contract to manufacture the samples now being placed on the market to introduce them.

The Billings & Spencer Company, of Hartford, Conn., are working up 8 tons of copper per month into the Billings drop-forged and cold-pressed commutator bars for dynamos.

For some time past the Mount Washington Glass Company, of New Bedford, Mass., have been experimenting with a mixture of crude petroleum oil and steam in their retorts as a substitute for coal. At first the success of this substitute was doubtful, but now Superintendent F. S. Shirley states that an entirely new burner and plan have been adopted and that the fuel is now working to perfect satisfaction.

The Springfield Emery Wheel Company, of Bridgeport, Conn., were forced a short time ago to make an assignment, owing to the incurrence of heavy debts arising from the removal of the works of the company from Springfield, Mass., to the present location. But the creditors are all in favor of some plan to aid the company to free themselves from their present financial difficulties, as it is generally believed that the company will be able to turn themselves by this action of the creditors, and save themselves from a collapse. A meeting of the creditors was held at Bridgeport on October 9, when the following statement of the company's condition was made:

Assets	$315,710
Liabilities, aside from capital, including creditors' claims, pay roll and interest	207,461
Surplus, aside from capital	108,248
Capital	150,000

A committee of five was appointed to confer with the company, and, if advisable, recommend plans for compromise or some other method of adjustment to the creditors. It was voted that pending a final adjustment of the affairs, all creditors abstain from attaching or otherwise legally encumbering the property and assets of the company, also that the committee's report be final. Work in the shops of the works is, and has been ever since the assignment, going on as usual.

Production of Bessemer Steel Ingots and Rails in the First Half of 1890.

The following table, just issued by the American Iron and Steel Association, shows the production of Bessemer steel ingots in the United States in the first half of 1890 compared with the production in each half of 1889. The production of steel ingots by the Clapp-Griffiths and Robert-Bessemer processes is included; we also add a statement of the ingots produced by the Clapp-Griffiths process alone. The production of Robert-Bessemer steel was very small.

Ingots.	First half 1889.	Second half 1889.	First half 1890.
	Net tons.	Net tons.	Net tons.
Pennsylvania.	990,748	1,042,797	1,254,929
Illinois	245,171	464,890	372,975
Other States	244,796	323,487	388,021
Total	1,480,715	1,861.114	2,015,925
Clapp-Griffiths only	38,356	44,494	39,469

The following table shows the production of Bessemer steel rails of all kinds and sizes in the first half of 1890 compared with the production in each half of 1889. In this statement we do not include the Bessemer steel rails which were rolled in iron rolling mills from purchased blooms:

Rails.	First half 1889.	Second half 1889.	First half 1890.
	Net tons.	Net tons.	Net tons.
Pennsylvania.	523,882	578,569	738,931
Illinois	179,201	342,853	279,407
Other States	16,572	5,705	25,916
Totals	719,572	927,127	1,044,254

The Iron Age

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CHAS. KIRCHHOFF, JR. - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Through Foreign Eyes.

The foreign iron and steel manufacturers who have just made a tour through this country cannot fail to carry home with them a most favorable impression of it. Their progress through the land has been a series of ovations. Wherever they stopped to visit works or inspect mines they were received with the most hearty expressions of good will, accorded the best facilities available to ascertain for themselves the nature of American methods, and were so often *fêted* that they must have had a surfeit of entertainments, receptions and banquets long before they arrived at their journey's end. They were not treated as foreigners, but as distinguished guests, whom the people of this country were proud to honor. They were not regarded in the sense of trade rivals, but were welcomed by our manufacturers as heartily as though they had been good customers. The utmost pains was taken everywhere to demonstrate the good will which Americans bear toward the other nations of the world, and especially toward those contributing such a large share of our population. The determination of all Americans was to treat their visitors so well that they could not fail to carry away with them an enduring impression of the good nature and hospitality of our citizens, and a desire to return for more leisurely study.

Those of our number who were able to travel to any extent with the visitors and mingle with them daily were frequently surprised by their discoveries of most interesting processes which our familiarity with American methods often prevents us from properly appreciating. They were quick to see and correctly value any methods of novelty or of special advantage in saving labor or increasing output. Probably the most interested group of spectators ever seen in a Michigan sawmill was a party of English and German iron and steel manufacturers who there saw for the first time a log cut into boards by a band saw, and had never heard of a feed carriage propelled by a steam piston. The quickness of movement shown by our workingmen was a revelation to them, and they received new ideas regarding the ability of an ordinary laborer to think how to save himself unnecessary steps. Occasionally a word of criticism was heard, but not very frequently. Much oftener came expressions of admiration and gratification. Our machinery was the subject of many encomiums. Its lightness as compared with European types, and yet its conceded strength and effectiveness, caused many favorable comments.

A German engineer of distinction observed that he had been greatly impressed by the character of belting in common use here. It is much wider, heavier and stronger than would be used abroad for the same class of work. The first cost would be considerably greater for the American belt, but he could see the advantage of such practice in the subsequent lessening of repairs and the more constant operation of the machinery. Yet in another direction this same engineer observed one of our shortcomings. We are not only wasteful of heat, but we do not economize in the use of steam as we might do. He acknowledged that we had less reason to be economical in fuel than most countries, because of our abundant supply of coal, but believed that the time is coming when manufacturers will find it of advantage to more closely study such details. A prominent American manufacturer of mining machinery agreed with him perfectly, and stated that he was conscious of a growing tendency among his patrons to adopt condensing engines and other steam and heat saving devices, although but a few years since there was no demand for them.

One good effect of this visit will be to dispel among a body of the most intelligent men of Europe the belief that Americans are merely braggarts and empty boasters. At first they were disposed to question the frequent use of the words "thousands" and "millions" by Americans when referring to statistics of output, &c. It was a standing joke with a large European manufacturer that as soon as he landed here he had to drop "hundreds" from his vocabulary, and as to "units" there were none known in American mathematics. Before he sailed from New York for his native land he was thoroughly convinced that this was a country of magnificent distances, magnificent achievements and magnificent people, with whom large figures were a necessity and not mere expressions of boastfulness.

The Pig Tin and Tin Plate Duties.

The various provisions relating to duties on pig tin and tin plate contained in the McKinley Tariff bill shroud the future of the market for the respective commodities in more than ordinary uncertainty. The effort to afford incentive to the development of tin mining and to the manufacture of tin plate in this country is commendable, yet the element of speculation is conspicuous. Development must be phenomenal within the time prescribed for the creation of the two industries. It is urged that consumers of pig tin and tin plate will have paid before that time a good many million dollars into the national Treasury. The duty paid on pig tin would amount to about $1,250,000 per annum for two years, unless the production of American mines shall have exceeded 5000 tons in any one year prior to July 1, 1895. The additional duty on tin plate will be upward of $8,000,000 per annum in case the output in this country shall have failed to reach a total equal to one-third of the amount of plates imported and entered for consumption during any fiscal year after the passage of the act prior to October 1, 1897.

That the pig tin market will be open to additional speculative influences there is scarcely any doubt, and the fact is not to be overlooked that the speculative element at present conspicuously identified with operations in the metal will play the new card to the best possible advantage in their own interest. It is clear, also, that a wider opportunity for speculative dealings in tin plate will be opened, probably to the disadvantage of various industries in which tin plate is largely used. Were it not that trade here is quick to respond to changed conditions, there might be cause for more complaint than has yet been found with the pig tin and tin plate sections of the Tariff bill. It therefore behooves the owners of American tin mines to get to work as expeditiously as possible, and to demonstrate their ability if possible to cope with the old producers under the protection of four cents per pound duty, and the sooner practical steps are taken in the direction of turning out tin plate the better it will be for all concerned.

The amendments to the tin plate section of the bill that were made just prior to its becoming a law meet objections previously raised, but at the same time they bring in complications that the casual reader may experience some difficulty in comprehending. For example, it is provided that in calculating the extent of importations, the quantity of tin plate used in the manufacture of articles exported, and upon which a drawback shall be paid, shall not be included. In other words, the American production, to gain the benefit of $2\frac{2}{10}$ cents per pound duty, will have to be equal to only one-third of the amount of plates manufactured into articles for home consumption. The large quantity of plates employed in the canning of petroleum and various other products for the export trade will thus be omitted from the sum total. This clause has a great deal more in it than would appear on the surface. Another fair provision in the direction of helping the home production up to the prescribed one-third of the importations is that which declares that "the amount of sheet iron or sheet steel manufactured in the United States and applied or wrought in the manufacture of articles or wares tinned or terne plated, with weight allowance as sold to manufacturers or others, shall be considered as tin and terne plates produced in the United States within the meaning of this act."

If the rather alarming predictions made by some writers for the British press fairly reflect the sentiment prevailing on the other side of the Atlantic, it might be presumed that the duty is looked upon as destined to ultimately cut off the entire shipments to this country, and in connection with the restrictions upon the importation of sheet steel, hoops, &c., work mis-

chief, particularly in Wales. It may be remarked, however, that this opinion is not shared by all authorities. Some point to the failure to make progress in tin plate manufacture in the United States under the 1 cent per pound duty in the face of great achievements in extension of the production of various forms of steel, and express a belief that America will use a great deal of foreign tin plate for years to come. It is highly probable, in any event, that large quantities of plate will be consigned to this country prior to July 1, 1891, when the increased duty goes into effect, which simply may serve to check a very heavy advance in prices for a time.

The Sources of Nickel Supply.

Since the discovery of the value of nickel steel plates large calculations of profit are indulged in by owners of nickel properties and others interested in smelting works. The future demands for armor plating are put down at large figures, and if accounts are entitled to credence there is something like a scramble by manufacturers in the United States and Europe to secure themselves from the greed of mine monopolists. The sources of supply, therefore, are inquired into with unwonted interest. Hitherto the demand for nickel has been on a comparatively limited scale. So it happened some years ago when mines were opened in Noumea and two full cargoes were shipped for consumption that the market at once became overstocked, prices dropped to a nominal figure, bankruptcy became imminent and the mines which had been exploited with so much enthusiasm were incontinentally closed. The situation at present is radically changed, for in addition to the wide demand for nickel in the arts, chiefly on account of its anti-corrosive qualities, the metal is discovered to possess a peculiar ductility which admits of its use as an alloy with special advantages. For example, a new French rifle cartridge has been brought out, in which nickel forms an essential part. But it was not until the superiority of nickel steel for certain purposes was announced that the nickel boomers got fairly to work.

The nickel mines in New Caledonia were the richest known up to a recent date, and were the principal dependence. Considerable quantities of nickel have come from mines in Norway, owned and worked by Sir Hussey Vivian, Bart., M. P. The United States Mint derived its supply from mines in Lancaster County, Pa., owned by Joseph Wharton. The discovery of nickel at Sudbury, in Canada, is of recent date, so that the development as yet is very imperfect. but indications point to the existence of the ore in large quantities. These mines are said to be owned jointly by a Cleveland syndicate, the Canadian Copper Company and Sir Hussey Vivian, the latter represented by Emerson Foote, of New York. The matte from Sudbury carries 30 per cent. of copper and 15 per cent. of nickel, and in this form is sent largely to Swansea, where the pure nickel is extracted.

We are informed that quite an extraordinary discovery of nickel has been made quite recently in Nevada. Among those best informed it is spoken of as "a wonderful development," and this representation is supported by the exhibit in this city of masses of ore. It is claimed that the nickel is found in deposits almost limitless and of such richness that even what is termed the lowest grade yields 8 to 12 per cent. of pure metal. Quantities aggregating hundreds of tons are in sight which give by analysis from 20 to 35.4 per cent. of ingot metal.

The consumption of pure nickel in the United States has been estimated at 800,000 pounds per annum. But in this country and elsewhere there will be increased demands, partly as a result of the recent discovery of malleable nickel used as a veneer for iron, which is made a more acceptable material for household utensils. Private London advices received in New York, and said to be wholly authentic, are to the effect that the British Government has recently been unable to place nickel steel orders, because the nickel could not be obtained. This small supply is attributed mainly to reduced receipts from New Caledonia. The present price in New York is 80 cents per pound for delivery during the ensuing year. From the foregoing it would appear that the Sudbury mines form the main reliance, although it is by no means certain, if entire dependence can be placed on the latest advices, that Nevada will not in due time be ranked equal, or even of more importance. Developments at these two points will be watched with unusual expectancy, especially if it is true that the New Caledonia mines are less productive than formerly.

The Alleged Gold Conspiracy.

The silver question is going through another interesting phase, falsifying all predictions. The feature now noted, and which not only confounds the so-called "silver kings," but the "gold bugs" as well, is the continued decline in the value of bullion, the purchases by the United States seeming to have no staying effect. The compulsory purchase of 4,500,000 ounces per month, enjoined by the law of the current year, is like dipping water from the ocean, so far as it exerts any appreciable effect either upon the available supply or the market valuation. It has upset all previous caculations, for instead of advancing silver to a parity with gold, as fondly anticipated, the tendency in prices has been to recede. So far as silver may be looked upon as a commodity this phenomenon, which some seem fully to comprehend, is comparatively a matter of little concern; but when considered in its relation to the basis of valuation, as affecting the prices of merchandise and all tangible property, the fact possesses a wide significance. It is just now attracting a good deal of attention in business circles, and is recognized as among the potent factors that delay the adjustment of values on a line promising stability, after a long period of disturbance from various causes. During the last month the price of silver has varied much as in other of the distinctly recognized "commodities"—a term, by the way, which is repudiated by silver champions as offensively degrading. But there is no escape from the fact. October 24 the quotation was 105 to 105½, the lowest since the highest price was reached—namely, 122—immediately when the present law went into effect, on August 13.

In 1878, when the requirement for coinage was made $2,000,000 in silver per month, the highest price made the silver dollar worth 93½ cents. Despite this absorption of metal the market declined until the dollar was intrinsically worth 70 cents. Under the latest enactment silver rose until confidence was felt that the silver dollar would be co-equal with gold in face value, but since then the drift has been lower and lower until last week, when silver was quoted 103, making the silver dollar worth less than 80 cents.

The fact explanatory of the latest movement in silver appears to be that speculators, tired of paying 2 cents per 1000 oz. a day for storage charges in New York, and discouraged by the outlook, have been constrained to unload. Of an aggregate of 10,000,000 ounces of silver in storage in New York, all but 3,000,000 are said to be in the vaults of a single company, most of it accumulated in expectation of an advance until silver was worth 1.2929, putting the dollar on an equality with the coin in gold. The most discouraging fact of all was that the Government was able to purchase from Western smelters at a rate below the asking price in New York, and that the amounts offered were five times in excess of requirements. There is also an accumulation in London, due to the falling off of demand in India. Hence it is no wonder that the "silver bulls" are disappointed and that in the silver market generally there is dissatisfaction and confusion.

On the part of the Western silver advocates there is a cry of "conspiracy." They charge that the gold bugs made a combine—that, in fact, silver has been "boycotted." The organ of the silverites, published in Cleveland, Ohio, says: "Secretary Windom seems also to be badly afflicted with the gold bug fever. He always had it and it is now chronic with him. He buys just as little silver as possible, and that at the lowest possible figure. If he were truly loyal to the cause of the people, and had the slightest comprehension of his great and important trust, he would not only buy his four and one half millions per month, but he would buy the few millions of surplus silver in New York, with which the conspirators continually hammer the market." In accordance with this view a loud call will be made in Congress at the next session for unlimited coinage. After all, it is well that the country has a plenty of silver. If a great speculation has been attempted, followed by collapse and heavy losses, that, too, is well.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., October 28, 1890.

The Secretary of the Navy is in almost daily conference with the chief officers of the Construction and Engineering bureaus on the subject of recommendations for additional ships for the navy, to be appropriated for in the Naval bill for the fiscal year 1891–92. With the exception of the Thomas monitor and the duplicate of the dynamite cruiser, all the new work authorized at the late session of Congress for the present fiscal year has been awarded or advertised. It is not only a credit to the efficiency of the administrative branch of the navy, but it is wise policy to get the ships authorized under way as quickly as possible, and particularly before the estimates for the next fiscal year are submitted. There is always a hesitancy on the part of Congress to go ahead with new when old work is left over undone. This difficulty will not stand in the way this year, as everything will have been disposed of before Congress meets.

The Congressional campaign is occupying so much attention among officials that public business will be practically at a stand still until after next Tuesday. Many of the officials have gone to their homes to vote.

The conference between the naval authorities and steel manufacturers will not result in any radical change in the present rules regulating tests of steel. The Government is very well satisfied with the results thus far achieved, and does not feel disposed to modify a system which has been instrumental in bringing the standard of American steel up to such a high point.

The interest of the people in the new Tariff act is strikingly exhibited in the numerous demands made upon the Congressional supply of that document. The act of 1890 and 1883, which it supplanted, are printed in a comparative form.

The contest in Chairman McKinley's district has assumed the dimensions of a national issue. It appears to be a straight out fight between the champions of tariff revision and the supporters of the new law. The result of the contest is watched with deep interest by both sides.

The presence of the members of the Iron and Steel Institute at the National Capital on last Saturday was made enjoyable by attentions from the President and committee officials and gentlemen from the scientific societies. There was much regret at the White House that the improvements then going on prevented the President from giving the distinguished foreigners as elaborate a reception as he desired. The sagacious management of Secretary Kirchhoff was a subject of favorable comment among the tourists. It is evident that the English and German members will carry back with them a very pleasant recollection of the person who did so much for their instruction and pleasure. If there had been more time an opportunity would have been accorded for a very thorough examination of the immense gun making plant at the Naval Arsenal.

Ex-Mayor Hewitt was a witness in the City Court, before Judge McGown, in the suit by O. M. Hartt against Gardner & Estes, shoe manufacturers. The defendants hired Hartt for a year as foreman at $37 a week, and the workmen claimed he wanted to break up their organization—a Knights of Labor Assembly—and struck. He was discharged in February, 1887. Mayor Hewitt raised a fund of $2161 for him, and testified that it was paid to plaintiff. The defendants claimed that the salary was paid by a third party (Mr. Hewitt), which the judge held was a good defense, and the jury rendered a verdict for the firm.

The Illinois Steel Company's Affairs.

Rumor has been very busy of late with the affairs of the Illinois Steel Company. The stock of the corporation had for a considerable time been exceedingly quiet, with few transactions, when it suddenly advanced in the Chicago and Boston markets $8 to $10 per share, subsequently selling at $120 to $125, whereas it had been quoted at $88 to $90. This caused considerable speculation among outsiders, who were quick to seize upon all sorts of theories to explain the rapid advance. Some of them were sure that an English syndicate was endeavoring to acquire control of the great property owned by the company. Others asserted that some of the stockholders were increasing their holdings in order to change the management. Telegrams from Boston connected the name of O. W. Potter with some kind of a deal into which it was said he had entered with a view to resuming the direction of affairs. On the 25th the definite announcement was made in the Chicago *Tribune* that Mr. Potter had secured control of the stock. That journal asserted that stockholders in New Bedford, Mass., had sold 15,000 shares to the Potter syndicate, and that the Thayer, Bartlett and Pierpont Morgan stock had been secured, which would together constitute more than a majority. Much more was said which it is not necessary to reproduce here, but which is simply a repetition of the stories that were current when Mr. Potter resigned the chairmanship of the Executive Committee last spring.

In view of the importance of this corporation and the wide publication of the rumors about it during the week, we have made inquiries which have put us in possession of facts that the iron trade should know. In the first place, it can be stated positively that there is no friction between Mr. Potter and his associates in the management of the Illinois Steel Company. Mr. Potter is a member of the Board of Directors, and retains that position in order to give the executive staff of the company the benefit of his intimate knowledge of the affairs of the North Chicago Rolling Mill Company. His retirement from the chairmanship of the Executive Committee was impelled by his own solicitude for his health, which could not endure the strain imposed by the onerous duties of that position. We venture to say that no man regrets more keenly than Mr. Potter the false position in which he is placed by the erroneous newspaper reports to the effect that he has been scheming to secure control of the company in order to overturn the present management. It is unfortunate that those who are endeavoring to account for stock fluctuations should jump at such a conclusion as this.

There is no question, however, that a movement is on foot by certain capitalists to secure a large block of the Illinois Steel Company's stock. The company's property is known to be very valuable, and their position in the Northwestern iron and steel trades is one of commanding importance. But those who are seeking the ownership of the stock are understood to be in search of a profitable investment. If the majority of the stock should pass into their hands the probability is strongly in favor of the retention of the present management, which has proved itself more than competent or capable. The combination of capitalists is not English, but exclusively American. The negotiations have not yet taken sufficient shape to en able a statement to be made relative to their exact nature, and some time may elapse until this occurs.

OBITUARY.

CAPT. GEORGE BRIGGS, who died in this city 21st inst., aged 83 years, was, in 1861, superintendent of the Collins Line of steamships, and in 1868 was appointed president of the New York Floating Dry Dock Company, a post which he held until his death.

SAMUEL ARCHBOLD.—Samuel Archbold, a man well known and highly esteemed in Pennsylvania and Maryland, died in Westover, Somerset County, Md., in his 75th year. In 1843 he entered the navy as an engineer, and was chief engineer on board the flagship of Commodore Perry's expedition to Japan. He retired from the navy in 1859, and in partnership with Thomas Reaney founded an extensive shipyard on the Delaware River at Chester, Pa. They expended thousands of dollars in extending the works, and built several monitors and war ships. The shipyard company assigned in 1871, when it passed into the hands of John Roach. Mr. Archbold then went to Philadelphia, where he became consulting engineer for the Philadelphia and Reading Railroad, which position he retained until 1880. The following year he took up his residence in Maryland, where he lived quietly.

JOHN LAWTON, a well known and highly esteemed hardwareman, of Evansville, Ind., died in that city on September 3, last. He was born in Sheffield, England, February 3, 1820, and was reared in his native place, where he received a fair common school education. In 1841 Mr. Lawton came to America and located in New Orleans. Here he was engaged for several years in the hardware business with several others. He next located in Cincinnati and opened a hardware store on his own account. In 1869 he removed to Evansville and continued in the same business, remaining thus engaged until his death. His death was not wholly unlooked for, his health for some months previously having been seriously impaired. He had many friends in the trade who will learn of his death with sincere regret.

PERSONALS.

Frederick Bishop, late of the Warren Rolling Mill Company, Warren, Ohio, has been appointed manager of the Calumet Iron and Steel Company's mill, at Cummings, Ill., succeeding B. L. Keen, who has resigned.

F. K. Warren, assistant superintendent of the Woodstock Iron Company's furnaces at Anniston, Ala., recently resigned that position to accept a similar one at Syracuse, N. Y.

G. G. Brown, formerly with the Crozer Iron Company, of Roanoke, Va., has accepted the position of foundryman for the Salem Iron Company, at Salem, Va.

C. E. Irwin, for some years secretary of the La Belle Iron Works, of Wheeling, W. Va., has resigned his position, and has been succeeded by John Wright, head bookkeeper for the firm.

F. R. Phillips, of 201 Walnut place, Philadelphia, has been authorized to act for the firm of rolling mill builders, Thomas Perry & Son, Limited, of Bilston, England, in the contracting for and erecting of tin plate mills of the most modern design.

R. Heckscher & Sons, lessees of the Swede Furnace, just below Bridgeport, Montgomery County, Pa., have broken ground for the erection of a new furnace with a capacity of a 1000 tons of iron a week. The contract calls for the completion of the work of erecting the furnace within nine months.

TRADE REPORT.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, October 29, 1890.

Pig Iron.—A better feeling is noticeable among the sellers of Lake Superior Charcoal. The weakness which was so apparent in some directions last week has disappeared to a great extent, and those in quest of bargains need a search warrant to find the cheap sellers. Several large contracts have been made for extended deliveries at $19.50, cash, and, although preference for certain brands may have influenced the buyers, it is not likely that they would have been willing to pay more than 25¢ to 50¢ for the privilege of making a choice. The drop in prices has had the effect of bringing out inquiries, and it is now known that Car Wheel makers will soon be in the market for considerable quantities. The prospects for this branch of the Pig Iron business are therefore somewhat brighter than they have been. Northern Coke Irons are well held, and a fair degree of activity is reported. Makers seem confident that trade will be good, and prices will be maintained for the remainder of the year. The blowing in of new furnaces may, however, have the effect of making prices easier, unless the local consumption increases sufficiently to absorb the larger output of Iron. This is possible, as all the foundries are very busy and new enterprises are going under way, which will soon require stock. Numerous inquiries are current for strong Softeners and buyers are inclined to contract ahead when slight concessions are made, but the leading makers are holding prices very firmly. Southern Coke Iron is apparently in good shape, as many furnace companies have advanced quotations 25¢, and the others talk of following suit shortly. There are some indications of a speculative interest in Pig Iron, which may develop itself if the market manifests a decided change either up or down. We make the following quotations, cash, f.o.b. Chicago :

Lake Superior Charcoal	$19.00 @	$20.00
Local Coke Foundry, No. 1	17.00 @	.....
Local Coke Foundry, No. 2	16.00 @	.....
Local Coke Foundry, No. 3	15.00 @	15.25
American Scotch	18.50 @	19.00
Southern Coke, No. 1	16.25 @	.....
Southern Coke, No. 2	15.75 @	.....
Southern Coke, No. 3	15.00 @	.....
Southern, No. 1, Soft	15.75 @	.....
Southern, No. 2, Soft	14.75 @	.....
Southern Gray Forge	14.75 @	.....
Southern Mottled	14.25 @	.....
Tennessee Charcoal, No. 1	18.50 @	.....
Alabama Car Wheel	22.25 @	23.50

Bar Iron.—Advices from Pittsburgh foreshadow an advance in Muck Bar at that point, on account of the shortage in the natural gas supply, which may have some effect on the price of Bar Iron at several Western trade centers and thus affect prices here. Several good sized orders for Car Iron were placed the last week, and inquiries are at hand from other car builders, as well as from jobbers, carriage makers and others. The Youngstown mills ask 1.75¢, half extras, at mill, but for desirable specifications would probably name 1.70¢. The price for local Iron ranges between 1.80¢ and 1.85¢ for good specifications. Jobbers' stocks of Bar Iron have been run down, and their customers have paid a slight advance recently to secure the quantity and sizes needed.

Structural Iron.—Carnegie, Phipps & Co. have been the fortunate bidders on some heavy contracts for Beams recently placed; other large deals are pending. The demand for Tees and Angles has latterly been unusually heavy. Tees are very scarce and outside prices have been freely paid. Quotations, f.o b. Chicago, in carload lots, are as follows: Angles, 2.35¢ @ 2.40¢; Tees, 2.90¢ @ 3¢; Beams, 3.20¢; Universal Plates, 2.45¢ @ 2.50¢; Sheared Plates, Iron, 2.50¢ @ 2.60¢; Steel, 2.60¢ @ 2.70¢; Beams sell from store in small lots at 3.70¢, but Angles and Tees at 10¢ @ 15¢ ℔ 100 above carload prices.

Plates, &c.—While the local trade has fallen considerably below the volume of business done in September, prices are very strong on account of the condition of the mills, the manufacturers refusing to make any concessions. It is perhaps fortunate under the circumstances that mill orders are quite light at this point. Store trade is excellent.

Sheet Iron.—Mills quote No. 27 3¢ @ 3.05¢ at mills and have few inquiries. Jobbers name 3.30¢ @ 3.40¢, for the same grade. Galvanized is in heavy demand, and manufacturers are again talking advancing rates. Spelter is very dear and hard to get. Small lots Juniata sell at 60 and 5 to 60 and 10 %.

Steel Rails and Fastenings.—Sales of Steel Rails have been light, but considerable business is in prospect. Eastern mills are reported to be making concessions to secure work for the balance of the year, but local prices are continued at $32 @ $32.50. No contracts have as yet been made for next year. Splice Bars are in good demand at 2.10¢ @ 2.20¢, for Iron, and 2.25¢ @ 2.30¢, for Steel. Spikes are quoted at $2.30 @ $2.35, and are hard to get. Track bolts are also scarce and quoted at 3.10¢ @ 3.15¢ for Hexagon Nuts.

Merchant Steel.—Although the volume of business is now comparatively light, prices seem to continue without a break, there having been no change in quotations for some time.

Old Rails and Wheels.—Old Iron Rails are lower; a lot of 1000 tons was sold at equal $26, Chicago. Other lots were offered at $26.50 without finding buyers, and $26 is probably top of the market now. Old Steel Rails are quiet and nominally worth $17 @ $20, according to length. Old Car Wheels are quoted at $18.75 @ $19, with but light sales.

Scrap Iron.—The demand for Wrought Scrap Iron is fair, but so much is being offered that values are shrinking, a large supply coming here from localities with which the current of trade is usually the other way. Dealers now offer $17 for Mixed Country. Their selling prices ℔ net ton are as follows: No. 1 Railroad, $21 @ $22; No. 1 Forge, $21.50; No. 1 Mill, $16; Fish Plates, $23.50; Axles, $26; Horse Shoes, $19.50; Pipes and Flues, $15; Machinery Cast, $13.50; Cast Borings, $9; Wrought Turnings, $12.50; Mixed Steel, $13; Coil Steel, $16; Leaf Steel, $17; Old Tires, $19.

Metals.—Dealers think that Lead has reached top prices, although they admit that the country is bare of stock and that a moderate buying demand would mark up values again. The week's sales footed about 300 tons and quotations are 5.35¢ @ 5.40¢ for spot and 5.25¢ for November. Spelter is scarce for spot delivery and held at 6¢ in carload lots, but offered at 5.80¢, November. Lake Copper is quiet at 17⅜¢, while casting brands are very firm at 14.50¢, in carload lots.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, October 27, 1890.

Pig Iron.—There is no particular change in the situation of the market. Prices are remaining practically about the same as has been reported for the last two weeks. There is a very heavy demand for all grades of Iron, and at the same time the production is very great. A number of the furnaces that have been out for repairs have now gone in, but their product is immediately taken up. The only question now among the producers and consumers is transportation, which is very scarce. The railroads seem to have realized the importance of this question of transportation to the extent of giving orders for something like 10,000 new cars. The demand for all kinds of Finished Iron is very great. There are numbers of large mills in the South, but they are all simply crowded with orders, and many orders are being turned off; $13 @ $13.50 is now the ruling price for No. 1 at the furnace, depending upon the size of the order. There is a difference, however, between Nos. 1 and 2 of about 75¢ ℔ ton, which the scarcity of No. 1 has brought about.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., October 28, 1890.

The market is in a very mixed condition, some articles being firm, with an advancing tendency, while others are just the reverse. Opinions are almost equally varied, some contending that things are shaping for an advance, others that the outlook is exceedingly gloomy. Both views appear to have good support, although, of course, they cannot both be right. The strong side of the market appears to be in Iron, the weak portion being confined to Steel. The manner in which the entire product of mills and furnaces is taken is surprising. Hence prices of both Mill and Foundry Irons are maintained in the face of increasing production, and the same may be said of all kinds of Finished Iron. Bessemer Pig and its products, however, are dull, weak and uncertain. There is no disposition to buy for forward delivery, unless at prices which would involve serious loss to makers, yet sellers are evidently anxious for business, or prices would not sag the way they do. Which side is going to carry the other? Steel is relatively lower than Iron, yet it is dull and neglected. The impression is that an adjustment will take place before long, but at the moment there is nothing to indicate that it will take place immediately, although it is not likely that a one sided market can continue for any length of time.

Pig Iron.—The market, on the whole, has been firmer than it promised to be a week ago. A good deal of Iron has been taken, simply because consumers needed Iron, and not because of special inducements in the way of lower prices. There is no superabundance of any grade of Iron, hence prices are maintained at about the figures recently ruling, say $18 @ $18.25, delivered, for Pennsylvania No. 1 Foundry, $16.50 @ $17 for No. 2 and $15 @ $15.25 for Gray Forge. Similar grades of Southern Irons can be made available at less money, say 50¢ to $1 ℔ ton less, according to circumstances, but even these grades are firm at the usual difference in price between them and local brands. In next report we will endeavor to adopt a classification of the various Irons, so that quotations may be given more definitely than is possible by simply quoting Pennsylvania Irons. Some of the stove founders, as well as other large concerns, have been inquiring for prices for next year's delivery, and in several instances contracts have been closed on the basis of $17.50 @ $18, delivered, for standard brands of Pennsylvania No. 1, $16.50 @ $17.25 for No. 2X and $15.75 for plain No. 2. Virginia Soft Irons have also been taken at about $17, delivered, for No. 1 and $16 for No. 2.

Bessemer Iron.—The market is in a very peculiar position. Makers claim that the scarcity and high price for ores must

eventually be reflected in the price of Pig, but for the present there is absolutely no demand from large consumers. Prices are nominally from $18 to $19 at furnace, but only small lots are taken, for special purposes, for which medium to outside figures are realized.

Spiegel and Ferromanganese.—Business is confined to very small lots at $31 @ $31.50, duty paid, for 20 % Spiegel and $68 @ $70 for 80 % Ferromanganese.

Steel Rails.—There is no improvement to note in this department, the amount of new business being very limited, considering the favorable terms that are offered to cash buyers. Prices are nominally $30 at mill and upward, sales of small lots on this basis being an ordinary occurreace, but on large lots $29 or less would probably be a fair quotation, for cash or its equivalent.

Steel Billets.—The market appears to be steadier than it was a week ago, although there is not much in the way of actual sales upon which to base this opinion. Sellers show more firmness, however, and for the present $30 for Nail Slabs or $30.50 for 4 x 4 Billets would be inside figures. Some makers quote still higher prices, but no sales are being made at figures beyond what we have quoted. This p.m. there is a good deal more inquiry, and if consumers really need the quantities they name a decided stiffening in value may be looked for. In some instances actual bids have accompanied inquiries, and for the moment things look like very considerable activity in the near future, and probably somewhat better prices.

Muck Bars.—There is a better demand for Muck Bars, and it begins to look as though sellers will maintain control of the market. Sales of 1000 ton lots are reported at $30 at Harrisburg, and for similar deliveries, and as there is an active inquiry from points further West, holders are more inclined to advance than to shade their recent quotations. As a rule $30 at mill is quoted, but at some locations $29.50 might be accepted, but as before noted the feeling is firm, although several hundred tons are offered this morning at $30, Philadelphia, and a first class quality.

Bar Iron.—The demand is still quite active for small and medium sized lots, but large orders are not as plenty as they were some time ago. Mills are full of work, however, and in many cases are unable to meet the demand for early deliveries, so that prices are fully maintained. The outlook continues to be favorable to the selling interests, and some of the most experienced men in the trade express the opinion that activity and firm prices will be maintained for a long time to come. Be that as it may, there is nothing unfavorable in the immediate outlook, so that manufacturers are firm at 1.85¢ @ 1.95¢ for city deliveries, and about 1.80¢ @ 1.85¢ at interior points.

Skelp Iron.—A good deal of business is being done, and on the whole at very satisfactory prices. In one or two instances a little less than 2¢, delivered, has been accepted for Grooved Skelp, but the usual figure is 2¢ @ 2.05¢, according to delivery. Sheared Skelp is irregular, some quoting 2.20¢ @ 2.25¢, delivered, while others are said to be offering at 2.10¢ @ 2.15¢, but the market is not weak, notwithstanding a little irregularity in prices.

Plates.—Large orders are not as numerous as they were some time ago, but mills have so much work on hand that, in connection with the current demand, manufacturers have all the business they can conveniently handle. The general feeling in the trade is that there will be no slacking off of any importance, and that by the time they are in a condition to accept new orders Government work will be ready for distribution. This expectation, combined with a very good demand for small lots, prevents anything like weakness in prices, although once in a while something less than ordinary quotations are heard of. The usual figures for lots delivered in consumers' yards are about as follows:

	Iron.	Steel.
Ship Plates	2.25 @ 2.30¢	2.40 @ 2.50¢
Tank	2.25 @ 2.30¢	2.40 @ 2.50¢
Bridge Plate	2.30 @ 2.40¢	2.50 @ 2.60¢
Shell	2.45 @ 2.55¢	2.65 @ 2.75¢
Flange	3.10 @ 3.20¢	2.90 @ 3.00¢
Fire-Box	3.75¢	3.75 @ 4.25¢

Structural Material.—Business is still in excellent condition. There is nothing specially new to report, but there is enough on hand and within reach to keep mills fully employed during the Winter months. Prices steady and unchanged, and as follows for lots delivered in consumers' yards: Angles, 2.20¢ @ 2.30¢; Sheared Plates, 2.40¢ @ 2 50¢, and from 10¢ to 20¢ more for Steel, according to requirements. Tees, 2.7¢ @ 2.8¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—Manufacturers are just as full of work as can be without inconvenience, and prices at a point bordering on an advance. Everything is firm at full quoted rates, while prospects as regards demand are of the most satisfactory character. Carload lots are firm at about the following figures:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24	3.20¢ @ 3.30¢
Best Refined, Nos. 25 to 26	3.40¢ @ 3.50¢
Best Refined, No. 27	3.50¢ @ 3.60¢
Best Refined, No. 28	3.60¢ @ 3.70¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¼¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24	3⅝¢ @ 3¾¢
Best Soft Steel, Nos. 25 to 26	3¾¢ @ 3⅞¢
Best Soft Steel, Nos. 27 to 28	@ 4⅛¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	
Best Bloom, Galvanized, discount	@ 60 %
Common, discount	62½ @ 65 %

Old Rails.—There is very little business to report at the moment, but prices are steady at about $25.50 @ $25.75 at seaboard, and $26.25 @ $27 at interior points.

Scrap Iron.—There is quite a scarcity of good Scrap, and sales are easily made at full quoted rates—say: No. 1 Railroad Scrap, $23 @ $23.50, Philadelphia, or for deliveries at mills in the interior $23.50 @ $24.50, according to quality and point for delivery; $15 @ $16 for No. 2 Light; $16 @ $17 for best Machinery Scrap, $15 @ $15.50 for ordinary, $15.50 @ $16.50 for Wrought Turnings, $11 @ $11.50 for Cast Borings, and nominally $26 to $28 for Old Fish Plates, and $17 @ $18 for Old Car Wheels.

Coke.—The demand is quite active, but prices are irregular, varying from $2 to $2.15 for Connellsville and from $1.85 to $1.95 for outside Coke.

Wrought Iron Pipe.—Business continues as active as reported for some weeks past. There is some difficulty, however, in mills making deliveries as promptly as desired, and on some sizes quite a scarcity is reported, mostly on 1½-inch pipe. Prices are firm and the outlook very encouraging. Discounts unchanged, as follows: Butt-Welded Black, 47½ %; Butt-Welded Galvanized, 40 %; Lap-Welded Black, 60 %; Lap-Welded Galvanized, 47½ %; Boiler Tubes, 1¼ inches and smaller, 45 %; 2 inches and larger, 50 %; Oil Well Casings, 50 %.

Warren, Wood & Co., Iron merchants of 115 Broadway, New York, have opened an office in the Bullitt Building, Philadelphia, under the management of C. S. Woodward.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, October 29, 1890.

Pig Iron.—Rumors of large sales and lower prices have been prominent features of interest in the local market during the past week, and these reports have received some verification. The fact that sales have been larger has not been questioned, neither has the report that some sales have been made at reduced prices; but the rumors that large contracts have been placed at lower prices have met with some opposition upon the ground that the statistical position is a strong one, and that with continued heavy consumption prices must advance. On the other hand, the close money market and the straightened financial circumstances of some furnaces is offered in explanation of the lower prices made. The tendency seems to be among the larger producers to stand aside and allow these pressed concerns to reap the benefit of their own actions, the belief being that with these furnaces eliminated the market will naturally react, but should these stacks stay in the market long enough to excite suspicion and the contracts of other producers run out, a general decline would result. The probability, however, is strongly in favor of improvement, although the sales being made for long deliveries—extending into next year three, four, and even five and six months—are looked upon with suspicion. The large sales referred to were all made early in the week, and at that time inquiries were spirited and for liberal amounts, but during the past few days dullness has been the most prominent feature. Even shipments upon old contracts have fallen off, and the market is slow and unsatisfactory. At the close the total sales for the week, however, aggregated upward of 35,000 tons, one lot of 12,000 tons made up of various grades, but mainly of Nos. 2 and 3 Foundry and Gray Forge, being the largest individual transaction. The demand, however, has been mainly for Mill grades, among the larger sales being 1000, 500, 300 1200 and 200 tons Mottled, 500 White, 1200, 500 and 500 tons Gray Forge, 500 tons No. 1 Foundry in lots; 500 tons No. 2 Foundry, 500 tons No. 3 Soft and 200 tons No. 3 Foundry, all Southern Coke Iron, on basis of inside quotations, and 500 tons Charcoal Iron at previous prices. We quote the prices current for cash, f.o.b. Cincinnati, as follows:

Foundry.	
Southern Coke, No. 1	$15.25 @ $15.75
Southern Coke, No. 2	14.25 @ 14.50
Southern Coke, No. 3	13.75 @ 14.00
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	16.00 @ 16.50
Mahoning and Shenango Valley	17.50 @ 18.00
Hanging Rock Charcoal, No. 1	21.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1	18.00 @ 19.00
Tennessee and Alabama Charcoal, No. 2	18.50 @ 19.50
Forge.	
Gray Forge	13.25 @ 13.50
Mottled Neutral Coke	12.75 @ 13.00
Car Wheel and Malleable Irons.	
Southern Car Wheel	22.50 @ 23.50
Hanging Rock, Cold Blast	22.00 @ 22.50
Lake Superior Car Wheel and Malleable	21.00 @ 22.00

Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date October 27, 1890, write as follows: While there has been considerable activity shown during the past week, sales have been generally of limited amounts, ranging from carloads up to 100 tons, and in a few instances of larger quantities. A number of inquiries for round lots of Lake Superior Charcoal have been received from entirely different localities, and furnaces were compelled to de-

cline to quote, as it would be impossible to make deliveries wanted. It was generally supposed that the larger buyers of this quality had all made their purchases for this season, but the inquiries go to show that such is not the case. There seems to be a general short supply of Foundry Irons in consumers' yards, and they are asking to have shipments hurried forward, and in a majority of cases deliveries are wanted faster than specified at time orders were given. With a firm and fairly active market we quote as follows:

Lake Superior Charcoal, all numbers	$20.00 @ $20.50
Lake Superior Coke, Bessemer	18.50 @ 18.75
Katahdin (Maine Charcoal)	23.50 @ 24.00
Lake Superior Coke, all ore	18.50 @ 19.50
Ohio Black Band (40 per cent.)	18.25 @ 18.75
Southern No. 1	16.50 @ 17.00
Southern Gray Forge	14.50 @ 15.00
Jackson County (Ohio) Silvery, No. 1	19.00 @ 19.50
Connellsville Coke	4.80 @ .....

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, October 27, 1890.

Pig Iron.—The market shows some degree of activity, while the past week has been well up to the average so far as the volume of business is concerned. A number of furnaces have very little Iron to offer, and in some cases have withdrawn certain grades from the market entirely, yet in the face of these facts the market refuses to advance. Prices have reached such a level, however, that it is doubtful if sellers are willing to make lower prices, as it is generally conceded that the Iron cannot be handled with profit at figures less than those quoted below. The present condition of the market is such that buyers and sellers alike are at sea regarding the ultimate result. There are generally some who are able from past experience to give a creditably good reason for this or that movement in the market, but the present condition of affairs seems to have nonplussed even the oldest heads in the business. There is no use denying the fact that sellers as a rule are disappointed at the present range of values, more especially as the conditions are such that higher prices should prevail. Consumption is large and keeps steadily increasing, production apparently makes no visible gain on consumption, the furnace banks are almost depleted, and many furnaces are sold up to January 1; yet in the face of these facts, which are decidedly favorable symptoms, prices are droopy, with an inclination toward weakness, and consumers are able to fill their requirements at a lower range of values than at any time this year. Are they taking advantage of this state of affairs? A review of the sales made during the past two months indicates that they are not. This is accounted for, however, by the statement that business methods are changing, and consumers who formerly figured on nothing less than 1000-ton lots are now content with purchasing from 200 to 300 tons and are thus able to make the cost of their year's supply average up better than by buying in large qantities. Regarding the immediate future there is nothing that is particularly encouraging, and in the same sentence we might add there is nothing that can be called discouraging. The probable outcome of the matter will be that prices now ruling will be continued, and should the demand set in heavy about the first of the year some improvement can be looked for; otherwise a steady adherence to the prices as quoted herewith is the best that can be hoped for. During the past week sales have been light, averaging from 200 to 300 ton lots for delivery during the next 30 days. Prices as quoted herewith are generally adhered to, except in such cases where a number of sellers are bidding against each other, when prices are occasionally made that cannot possibly net the furnace any great profit. The following prices are for cash, f. o. b. St. Louis

Southern Coke, No. 1 Foundry,	$15.75 @ $16.25
Southern Coke, No. 2 Foundry,	14.75 @ 15.25
Southern Coke, No. 3 Foundry,	14.25 @ 14.75
Gray Forge	13.75 @ 14.25
Southern Charcoal, No. 1 Foundry	17.50 @ 18.00
Southern Charcoal, No. 2 Foundry	17.00 @ 17.50
Missouri Charcoal, No. 1 Foundry	16.00 @ 16.50
Missouri Charcoal, No. 2 Foundry	15.50 @ 16.00
Ohio Softeners	18.00 @ 19.00

Bar Iron.—The movement in this department continues to be large and mills report their order books well filled to the first of the year. Consumers who have their orders already booked are calling for shipment, and mills in some cases are unable to comply with their requests. As a rule, however, they are in position to ship with enough promptness to meet all requirements. Prices are strictly adhered to, as follows: Lots from mill command 1.95¢; small lots from store are quoted at from 2.10¢ to 2.15¢.

Barb Wire.—There are no new features to report in connection with this department. The volume of trade is not large, but is fairly satisfactory for the season. Prices are generally supposed to be as low as they can possibly go and net the mills any profit. As a consequence, jobbers are making inquiries, and an increased trade is looked for as the result of these prices. We quote as follows, f.o.b. cars St. Louis, terms 60 days, or 2 % discount for cash within ten days from date of invoice: Painted, 2.80¢; Galvanized, 60¢ additional; carload lots 5¢ ℔ cwt. less than above prices.

Cleveland.

CLEVELAND, October 27, 1890.

Iron Ore.—Receipts of Ore for 1890 are still nearly 1,000,000 tons in advance of the record at a corresponding time last year. The rough weather on the lakes during the past week has, however, given rise to fears that navigation will close much earlier than last season. There have been unloaded at lower lake ports to date about 7,250,000 tons of Ore. Ore freights are so low, however, that many vesselmen will not suffer their craft to venture up the lakes after severe weather sets in for good. Because of this it is not an easy thing to calculate the increase of this year's output over that of 1890. It will, however, be considerable. There is still a good demand for Ore, and odd and end lots are eagerly snapped up at prices about 50¢ ℔ ton in advance of midsummer quotations. So far as can be learned there has thus far been no talk whatever regarding next season's prices.

Pig Iron.—Prices remain stationary but there is a slight improvement in the amount of business being done. Stocks are very low, and it does not seem possible that the present apathy can continue much longer. There are absolutely no new features in the situation, but the consumption of Iron is so great that interesting developments are anticipated next week. Quotations are just at present quite valueless, different brands of Iron of the same general character selling for widely varying figures.

Manufactured Iron.—There is no cessation in the demand for all kinds of Merchant Iron. Although sales of Bar Iron are said to have occurred at 1.75¢ from mills, 1.80¢ is nearer the actual figure. Muck Bar at $30.50 @ $31, continues in high favor. Almost any price asked can be obtained for Sheets. The mills are unable to take more orders for delivery this year, being overcrowded with work.

Scrap.—No. 1 Railroad Wrought is still in fair inquiry at $22 @ $22.50. No. 1 Forge Iron is worth $21 @ $21.50; No. 1 Mill, $16 @ $16.50; Cast Scrap, $13; Old Car Wheels, $18, and old Axles, $28.

Old Rails.—The market is rather dull, with $27 @ $27.50 given as quotations.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, October 28, 1890.

The notable event of the past week was the discontinuance of natural gas as fuel to a number of Iron and Steel mills. Some of these have already gone back to coal and others are having their puddling furnaces altered so as to make the change. The Philadelphia Company claim to have just as much gas as they had a year ago, but they say there is more money in supplying private consumers, and that this was the sole reason of the movement noted. It is probable that a fuel gas will be made to take the place of the natural gas.

Pig Iron.—There has been more activity the past week; consumers seem more disposed to anticipate future wants. Furnacemen, on the other hand, are not so anxious to sell, especially for future delivery, although there is nearly always some one forced to sell in order to raise money. Prices on Forge and Foundry Irons remain unchanged, while Bessemer is lower, a lot of 4000 tons for immediate delivery having been sold at $17, cash, and some smaller lots were reported at $17 @ $17.25. Contracts for future delivery could be made at the lowest price named. We quote as follows:

Neutral Gray Forge	$14.75 @ $15.00,	cash.
All Ore Mill	15.50 @ 16.00,	"
White and Mottled	14.00 @ 14.50,	"
No. 1 Foundry	17.00 @ 17.25,	"
No. 2 Foundry	16.00 @ 16.25,	"
No. 3 Foundry	15.50 @ 15.75,	"
No. 2 Charcoal Foundry	21.50 @ 22.00,	"
Cold Blast Charcoal	28.00 @ 30.00,	"
Bessemer Iron	17.00 @ 17.50,	"

The stock of Pig in first hands west of the Allegheny Mountains has been reduced some 50,000 tons since August 1, and while production is falling off, consumption is as large as ever. It is reported that Chicago has been a large buyer of Bessemer Iron in the Shenango and Mahoning Valleys within the past week, and several round lots are known to have been taken for the Wheeling district. A number of furnaces are refusing to sell Bessemer at the prices quoted

Muck Bar.—There has been considerable business the past week at prices quoted the week before, $31, $31.25 and $31.50, cash, for delivery between now and February and March. There is now more money in making Muck than there is in working it up into finished material, and, as might be expected, there is more of it being made for sale. It is offering here from all parts of the country. Included in the sales was a lot sold by a Lynchburg (Va.) mill, and another large block is reported as having been offered in this market by a Southern mill. Under the influence of these increased offerings the market is showing signs of weakness, and it is doubtful whether additional large contracts could be made at present prices. As it now stands, Muck Iron is bringing from $2.50 to $3 ℔ ton more than Steel Billets and Steel Rails, something very remarkable.

Ferromanganese—Continues dull. An occasional small sale of 80 % domestic is reported at $71.50 @ $72 for immediate delivery. Foreign can be put here for considerably less, but the demand is mainly for small lots, and consumers prefer to pay a little more for domestic.

Manufactured Iron.—Possibly there is not so much new business, but the mills are all very busy, and many of them will have all they can do during the remainder

of the present year. But very few of them are in condition at present to take orders for immediate delivery. Prices remain unchanged: Bars, 1.85¢ @ 1.90¢; Plate and Tank, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢; Grooved Skelp, 1.85¢ @ 1.90¢; Sheared Skelp, 2.15¢ @ 2.20¢, all 60 days, 2 % off for cash.

Nails.—There is very little doing in Cut Nails. The Wire Nail market is reported fairly active, and while we make no change in quotations, $2.25, 60 days, 2% off, f.o.b. at maker's factory, the market is reported firmer.

Wrought Iron Pipe.—The Pipe mills continue very busy, and will be until well to the close of this year. The trouble with them just now is that they cannot meet the demands being made upon them on old contracts, as the buyers are all very clamorous, being anxious to get all the work done they possibly can before winter sets in. No change in prices. Discounts on Black Butt, 47½ %; on Galvanized do, 40 %; on Black Lap 60 %; on Galvanized do, 47½ %; Boiler Tubes, 1¼ inches and smaller, 45 %; 2-inch and larger, 50 %; Casing, all sizes, 50 %.

Merchant Steel.—There is continued activity reported. No change in prices. Tool Steel, 8¢ and upward; Crucible Spring Steel, 4¢; Crucible Machinery Steel, 5¢; Open Hearth Steel, base sizes, 2¼¢ @ 3¢; Bessemer Machinery Steel, 2.40¢ rates; Tire Steel, 2.55¢ rates.

Structural Iron.—The activity noted for some time past continues; mills are all very busy and likely to be until the close of the present year. No change in prices, which are steady as quoted: Angles, 2.30¢; Beams and Channels, 3.10¢; Tees, 2.85¢; Steel Bridge Plates, 2.65¢ @ 2.70¢; Universal Mill Plates, Iron, 2.40¢; Refined Bars, 1.90¢ @ 1.95¢.

Steel Plates.—The mills continue very busy, but prices remain unchanged. Fire Box, 4.25¢ @ 4.75¢; Flange, 3.10¢ @ 3.20¢; Steel, 2.90¢; Tank, 2.50¢ @ 2.55¢.

Wire Rods.—Notwithstanding reports to the contrary, best posted authorities know of no sales under $40.50, cash, at maker's mill, which is regarded as bottom, and the general quotation is $40.50 @ $41. There is a fair demand, and, so far as we are advised, the Rod mills are pretty fully employed.

Billets and Slabs.—There is continued weakness reported in regard to Billets, but $28, cash, at maker's mill, still appears to be regarded as the ruling price; it is rumored, however, that a sale was made by a Pittsburgh mill at $29, delivered at Cleveland, which would be equal to about $27.75 Pittsburgh. Once the market becomes more settled there will be no doubt of an improved demand, as a good many consumers are now holding off or buying only as their immediate wants require. There is very little demand for Nail Slabs, owing to the unsatisfactory condition of the Nail trade.

Old Rails.—There is rather more inquiry for Old Iron Rails, and a firmer feeling obtains. We are advised of sales at $28, and are cognizant of that price having been refused for a lot. Old Steel Rails continue dull, and for remelting purposes are quotable at $19 @ $20.

Railway Track Supplies.—There is a continued fair business, but prices remain unchanged. Spikes, $2.20, on cars at makers' works, 30 days; Iron Splice Bars, $1.95 @ $2.05; Steel Splice Bars, $2 @ $2.10; Iron Track Bolts, $2.90 with Square and $3 with Hexagon Nuts.

Steel Rails.—The report from New York that sales have been made here at $29.50, on cars at works, may be true, but if so it has been kept pretty quiet. However, there is no disputing that the market is weak. If such a sale was made the order must have been a very desirable one.

Old Material.—Dealers generally report trade as being only fair, and, while prices remain unchanged, the feeling is not as confident as it was a few weeks ago. There has been considerable inquiry in the Mahoning and Shenango valleys of late for No. 1 Railroad Wrought Scrap, with sales at $22.50 @ $22.75, delivered there, but there is not much inquiry in this market. Steel Bloom and Rail Ends are reported dull at $20 @ $20.50; Old Car Wheels, nominal, at $18 @ $18.50.

Connellsville Coke.—There is continued complaint of a scarcity of cars, which, it is intimated, is caused as much by bad management on the part of the railroads as by anything else. Prices remain unchanged. Furnace Coke, $2.15, on cars at ovens; Foundry Coke, $2.45; Crushed Coke, $2.65. Freight rates unchanged.

(*By Telegraph.*)

No. 1 Forge Irons, it is said, are being offered as low as $14.75 @ $14.85 cash, but furnacemen generally are refusing to cut under $15. Sale, 500 tons Bessemer at $17.25 cash and 1000 tons Bessemer at $17 cash. There appears to be more inquiry for Old Iron Rails. Sale, 1500 tons at $27.75, delivered at Youngstown. Muck Bar is offering more freely for late winter delivery, and the market is weaker.

The offices of H. E. Collins & Co., brokers in Iron and Steel, formerly located in the St. Lewis Block, Pittsburgh, have been removed to the Bank of Commerce Building, corner of Sixth avenue and Wood street.

The firm of Jas. Chas. Read, broker in Iron and Steel, formerly located in the Penn Building, Pittsburgh, has been succeeded by the firm of Read, Irwin & Read, with offices in the Lewis Block, Pittsburgh. The new firm is composed of Chas. H. Read, A. M. Irwin and Jas. Chas. Read. They will do a general brokerage business in Iron and Steel.

The firm of Read, Irwin & Read has been organized at Pittsburgh to succeed to the Iron and Steel brokerage business recently established by James C. Read at 411 Lewis Block.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, October 29, 1890.

American Pig Iron.—The situation is practically the same as outlined last week. In any event, it does not transpire that sales have been larger or the demand more extensive, and evidence is wanting of any pressure of either Mill or Foundry grades for sales in this quarter. To all accounts the deliveries of high grade Foundry Iron continue to closely absorb the current output of popular brands, Northern and Southern, and prices for this class of material are, therefore, particularly firm. As an instance of the character of the movement statistics of a prominent Lehigh company are cited, showing for the week ending October 25 deliveries of no less than 4277 tons, against an output of 3500 tons. This is doubtless an exceptional exhibit, but it may be remarked that the offerings of other popular Northern brands are by no means heavy, and that deliveries of certain Southern makes that stand well with consumers in this section are not as free as might be desired. Of No. 2 Foundry the supply is ample, however, although apparently not burdensome, and there is sufficient Mill Iron to go around. For the week under review no changes in values are to be recorded. We quote $17.50 @ $18 for No. 1 and $16 @ $16.50 for No. 2 Foundry, good Northern brands; $17 @ $17.50 for No. 1, $16 @ $16.50 for No. 2 and $14.75 @ $15.25 for No. 3 Southern.

Spiegeleisen and Ferromanganese.—The depression in the market for Steel productions operates to restrain business momentarily, and the market is in a rather unsettled condition for the time being. A lot of 20 % German Spiegel has been taken at $30, but popular English brands are quoted at $31.50 upward, and $31 is considered very close value. Of 80 % Ferromanganese, small sales at $68.50 @ $69 at tide water, to arrive, were mentioned, but those figures are below the general quotations.

Steel Rails.—The meeting of manufacturers on the 22d inst., it is learned, did not terminate in a manner conducive to general good feeling To the contrary, it would seem that the gathering reflected a degree of independence incompatible with the aims of "association." In any event, the developments on the market since the meeting show very conclusively that there is no uniformity of action at the present time either as regards distribution of business or maintaining prices; and the few particulars divulged as to action at the meeting and regarding subsequent transactions indicate that individual concerns are free to do as they please. Under the circumstances it may be superfluous to remark that the market is practically demoralized. One Eastern company is reported to have taken an order for 3000 tons 60-lb section, this year's delivery, at $31, landed at Charleston. Other transactions involving a total of about 15,000 tons have taken place on which the terms were not above the basis of $29 at mill. Several lots of Light Rails have been closed for at prices on the basis of $30 for standard sections.

Steel Billets.—Eastern mill prices are nominally $29.50 @ $30, and sales at those figures are slow, while Western Pennsylvania concerns are represented as being willing sellers at $28 at works.

Steel Wire Rods.—Prices as low as $40 @ $40.50 are said to have been accepted in Western Pennsylvania, and $42.50 @ $43 are named as full figures in quarters further East.

Rail Fastenings.—There is considerable irregularity in this line, and lots from second hands are selling at a round concession from manufacturers' prices. Spikes have been sold at 2¢ Steel Plates at 1.80¢, Iron Plates at 1.95¢ and Bolts and Hexagon Nuts at 2.75¢, all New York delivery.

Old Rails.—There has been very little business here, and the demand is slow, with offers rarely above $25 for Tees. About $25.50 @ $26, on cars, appears to be full value at the moment.

Scrap Iron.—For Wrought Scrap there is little demand and prices are uncertain, with $21 @ $21.50, f.o.b. cars, apparently all that No. 1 would bring.

Warrant Stocks.—The American Pig Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard, October 21	65,200
Put in yard seven days ending October 28	100
Total	65,300
Withdrawn seven days ending October 28	....
Net stock in yard, October 28	65,300

Montgomery & Co., of 105 Fulton street, have issued the following price-list of

Stubbs' Bright Steel, in 1 foot of 3-foot lengths:

Nos. 1 to 5	$0.95	Nos. 66 to 68	$4.30
Nos. 6 to 15	1.10	Nos. 69 to 70	4.70
Nos. 16 to 30	1.25	Nos. 71 to 73	5.15
Nos. 31 to 38	1.35	No. 74	5.60
Nos. 39 to 46	1.55	No. 75	5.80
Nos. 47 to 50	1.80	No. 76	6.00
Nos. 51 to 54	2.10	No. 77	6.45
Nos. 55 to 57	2.60	No. 78	6.85
Nos. 58 to 60	3.00	No. 79	7.30
Nos. 61 to 62	3.40	No. 80	7.75
Nos. 63 to 65	3.90		

The discounts remain unchanged.

Financial.

In local trade business has been curtailed to some extent by storms interfering with shipments and transportation. Among dry goods jobbers there are symptoms of an early development of spring trade and a good demand. Prices in all classes of foreign goods are strong at the recent advances. Intelligence is received that quite a number of foreign manufacturers contemplate transferring at least a part of their plant to the United States, to make goods excluded by the new tariff. It is stated that a great establishment in Vienna for the manufacture of pearl buttons is preparing to remove its machinery to America. Values in several lines of merchandise are unsettled by the continuous decline in silver. Nor is the money situation altogether satisfactory. Money continues to go from this center, and it is also absorbed by the Treasury, and though there is a standing offer to take bonds, the amount sent in has not as yet been enough to offset what the Treasury absorbs. Money on call in the latter part of the week ranged as high as 8 %. Time money is not plentiful, and all loans are made at 6 % or above. The banks are now only $124,870 below the legal requirement. A year ago they held $1,129,275 above, but by November 9 this surplus had been wiped out and they were $760,850 below. From the latter date the reserve crept up until on December 21, 1889, the excess was $3,393,725. A favorable circumstance is the rapid shipment of cotton. The movement of the crop this season is on a large scale, and so far has tended to favor the largest estimates. Every channel through which the crop is moving into consumption is crowded. The amount of the crop brought into sight thus far for the season to date, is 1,725,030 bales, against 1,507,950 bales last year. Notwithstanding this large increase the surplus has moved off as rapidly as it has come into sight. In petroleum, too, there is a continued activity of production and steadily increasing demand for export, largely in excess of shipments last year. These two items, cotton and petroleum, go far to compensate for the diminished export of breadstuffs and grain. Much inconvenience among traders and others making weekly payments has resulted from the scarcity of small bills. The difficulty is attributed in part to the Government arrangement designed to facilitate the transportation of money to a distance by the United States Express Company. Treasurer Huston says that he expects to have ready for issue by November 1 a large supply of $1, $2 and $5 Treasury notes, and that they will be used in the purchase of silver bullion in order to meet as far as possible the present demand for notes of small denominations.

The stock market was irregular and weak, the disturbing influences being mainly a break in Sugar Trust and free selling of Union Pacific on news that other roads are attempting a boycott, for the diversion of its freighting business, in retaliation for its combination with the Chicago and Northwestern. An optimist view is that this difficulty will hasten a settlement of railroad troubles west of Chicago. One feature was a drop in silver bullion certificates, in consequence of lower prices in London. Regarding the stories published about the Sugar Trust, Attorney-General Tabor says he is not interesting himself further than insisting that the trust be dissolved according to the decision of the Court of Appeals. On Monday Sugar Trust advanced on the report that the refineries are valued at $25,000,000 and that the other assets amount to $11,000,000. A Salt Lake paper says dealing in silver certificates will be one of the leading features on the Stock Exchange hereafter. The general merchandise markets, as a rule, show little animation. Wheat and corn are a shade better on improved export demand. Spot cotton is $\frac{1}{16}$ lower and favors buyers. In provisions there is a moderate business at steady prices. Rubber is fairly active, prices irregular. Tobacco is in steady demand for export at full prices for best grades. Groceries are dull in all lines. Total exports for the week, $7,205,000.

United States bonds were strong and quoted as follows:

U. S. 4½s, 1891, registered	104¼
U. S. 4½s, 1891, coupon	104¼
U. S. 4s, 1907, registered	124¼
U. S. 4s, 1907, coupon	124¼
U. S. currency 6s, 1895	113

Foreign exchange was quiet, with nominal rates ½¢ lower at $4.81½ @ $4 86. Bar silver closed in London at 48½d ℔ ounce, and in New York at $1.04 @ $1.04½ ℔ ounce. Two million dollars in English gold were received in San Francisco in return for American products shipped to Australia.

Complete returns of the foreign commerce of the United States for September are at hand and are scanned with unusual interest. The figures show a gain in all the ports outside of this city of less than $9,000,000, making the total excess as compared with the same month of the preceding year only $22,000,000. The total, including specie, is only $79,739,869, against $67,108,170 for the same month ten years ago. The exports for the month amounted to $71,235,709, showing a gain of upward of $3,000,000. The balance of trade for the month is $8,504,160, against this country, while for the corresponding month of last year the exports exceeded the imports $10,415,029. The exports since January 1, including specie, have been about the same as for the corresponding nine months of last year, but in produce and merchandise the shipments show an increase of about $33,000,000. Leaving out the specie the imports for the whole nine months have increased only $10,000,000 more than the exports.

Total east bound tonnage from Chicago last week 68,037 tons, against 67,963 tons the week before, and 70,166 tons the corresponding week last year.

Metal Market.

Copper.—No transactions in Lake Superior product in which the mining companies figure as sellers come to notice, and it is asserted that the producers are still quoting 17¢, with more or less showing of firmness. However, outside lots continue to be let go at a considerable concession on that price, as, for example, several parcels at 16⅝¢ @ 16¾¢, and the market presents a slightly ragged appearance. For Arizona Ingot 15¼¢ is generally quoted, but it is no secret that firm offers of 15¢ would be quickly taken up, and there is good authority for the report that small quantities have been sold at down to as low as 14¾¢. Common casting brands are now at about 14¢ and moving off rather slowly.

Pig Tin.—During the early part of the week under review prices receded a small fraction under the influence of adverse London cables. Since then the foreign advices have been rather more favorable and values have hardened somewhat. Speculation has dragged along wearily, however, purchases by consumers have been of merely routine character, and the market has presented a tame appearance. On Tuesday spot Straits was offered at 21.50¢, net cash, in 10-ton lots, while that price was bid for all October and November deliveries, and 21.45¢ for December. On Wednesday there were sellers of spot and October at 21.50¢, with 21.45¢ bid, while later deliveries remained unchanged. One of the strongest bidders, it was reported, has been selling in Western markets at 21.50¢, 30 days, for December and January delivery. There was a transaction between two local operators involving a total of 140 tons, deliveries from November, 1890, to December, 1891, inclusive, at a sliding scale of prices from 21.80¢ for next month, making the average 21¢.

Pig Lead.—The market is at present in rather uncertain shape, and there is little business passing. Domestic on the spot is generally held at 5.90¢ upward, and bids of 5.80¢ were recorded on the Exchange, yet single carloads offered to consumers at 5¼¢ were not taken. For late November and December delivery 5.30¢ @ 5.35¢ has been quoted without leading to important business. Operations in foreign have been moderate, but London quotations come 5/ higher, and quotations for prompt shipments are now about 5¼ @ 5.30¢, delivered here.

Spelter.—Prime Western is again rather higher and very sparingly offered at the enhanced prices. Very little can be secured for early November shipment, and last half is quoted at 6.10¢ @ 6.15¢. The demand at present is slow.

Antimony.—Apart from the ordinary jobbing movement there is little doing. About 18¢ is quoted for Hallett's and 20¢ for Cookson's.

Tin Plates.—Petroleum packers have purchased several lots of 14 x 19¼ Cokes, paying $5.60 for November and $5.70 for December–January delivery. Otherwise, little has transpired in the way of business in futures. Spot transactions have been of merely fair volume. Cheap lots are not as freely offered at the present time, however, as they were a week ago, but the supply on hand is now liberal, and the assortment good. Quotations for round lots on the spot are as follows: Coke Tins—Penlan grade, IC, 14 x 20, $5.42½ @ $5.47½; J. B. grade, do., $5.50. Bessemer do., $5.50. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.45; Siemens Steel, IC basis, $5.50; IX basis, $6.50. IC Charcoals—Calland grade, IX, ——; Melyn grade, $6.12½ @ $6.25; for each additional X add $1.50; Allaway grade, $5.87½; Grange grade, $6; for each additional X add $1. Charcoal Ternes—Worcester, 14 x 20, $5.50; 20 x 28, $10.87½; M. F., 14 x 20, $8; do., 20 x 28, ——; Dean 14 x 20, $5.25; do., 20 x 28, $10.40; D. R. D. grade, 14 x 20, $4.85 @ $4.90; do., 20 x 28, $9.75 Mansel, 14 x 20, $4.95 @ $5; do., 20 x 28, $10; Alyn, 14 x 20, $5.12½; do., 20 x 28, $10: Dyffryn, 14 x 20, $5.75; do., 20 x 28, $10.50; Wasters—S. T. P. grade, 14 x 20, $4.65; do., 20 x 28, $9.50; Abercarne grade, 14 x 20, $4.60; do., 20 x 28, $9.50.

New York Metal Exchange.

The following sales are reported:

THURSDAY, October 23.

10 tons Tin, October.....21.40¢

TUESDAY, October 28.

30 tons Tin, October.....21.50¢
140 tons Tin for delivery 10 tons each month, November, 1890, to December, 1891, at 21.80¢ first month, and 10 points less each succeeding month down to 20.50¢ for last month.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, October 29, 1890.

The trading in Pig Iron warrants has been moderate, but prices have averaged somewhat better, with Scotch selling up to 51/3, Cleveland to 48/ and Hematites to 58/2, the latter subsequently reacting to 57/6. The improvement is due to a recovery from the set back occasioned by the difficulties in financial circles in London, the most of which is said to have been arranged. Consumers are still covering against forward contracts, as there is yet much uncertainty as to the future. The strike, it is feared, will be protracted. Shipments to the Continent are lessening, but a heavy reduction in stocks on this side is still taking place.

Prices for Block Tin, on the spot, have advanced £1. 10/, selling up to £99. 10/, but futures have improved only 10/. Cash Tin is positively scarce and supplies here are low. Holders, it is expected, will advance their prices, as the consumption is heavy, chiefly at Tin Plate works.

Copper has been rather slow and the appearances are that consumers' immediate wants are well supplied by recent heavy deliveries. Holders, however, are not disposed to increase engagements. Outsiders are holding off. The action of the Tharsis Company *vs.* the Société des Métaux, for damages for breach of contract, was decided in favor of the former on Saturday.

The Tin Plate market is rather easier. Orders are scarce and buyers seem inclined to suspend operations for a time. Sellers look upon the quieter market as being merely a temporary lull and makers hold steadily to former prices. Business continues to be chiefly in Cokes.

Rather more interest has been manifested in Old Material, including a good demand for Rails from America.

Scotch Pig Iron.—Makers still refrain from quoting prices, and the market remains dull.

No. 1 Coltness,	f.o.b. Glasgow	.....	Nominal.
No. 1 Summerlee,	" "	.....	
No. 1 Gartsherrie,	" "	.....	
No. 1 Langloan,	" "	.....	
No. 1 Carnbroe,	" "	.....	
No. 1 Shotts,	at Leith	.....	
No. 1 Glengarnock,	" Ardrossan	.....	
No. 1 Dalmellington,	" "	.....	
No. 1 Eglinton,	" "	.....	

Steamer freights, Glasgow to New York, 2/, nominal; Liverpool to New York, 10/.

Cleveland Pig.—Business continues slow, and makers' prices are steady, with 48/ still quoted for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—The demand has fallen off this week, but prices show little change. Makers quote West Coast brands, Nos. 1, 2 and 3, at 58/, f.o.b. shipping port.

Spiegeleisen.—There is a very fair demand and the market is steady. English 20 % quoted at 100/, f.o.b. shipping port.

Steel Rails.—There has been an active demand and the market is strong, with prices higher. Heavy sections quoted at £5. 5/ and light sections £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—A fair business passing and prices steady. Makers quote at £5 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The market is fairly active and prices are firm, but without further change. Bessemer, 2½ x 2½ inches, £5. 2/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—Prices remain firm and the demand is fair. Bessemer quoted at £5. 2/6, f.o.b. at N. W. England shipping point.

Old Iron Rails.—Business moderate, although export inquiries are better. Tees quoted at £3. 2/6 @ £3. 5/ and Double Heads £3. 5/ @ £3. 10/, f.o.b.

Scrap Iron.—There is little doing and prices remain the same. Heavy Wrought quoted at £2. 6/ @ £2. 7/6, f.o.b.

Crop Ends.—The market is quiet and prices are without change. Bessemer quoted at £3 @ £3. 2/6, f.o.b.

Tin Plate.—Demand is slow at present, but prices are firmly held. We quote f.o.b. Liverpool:

IC Charcoal, Alloway grade	18/6 @ 19/
IC Bessemer Steel, Coke finish	17/9 @ 18/
IC Siemens " "	18/ @ 18/3
IC Coke, B. V. grade	17/6 @ 17/9
Charcoal Terne, Dean grade	16/9 @ 17/

Manufactured Iron.—Business in this line has been slow throughout the week and prices have not changed. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	.....			@	9	0	0
" Common "	7	0	0	@	7	5	0
Staff. Bl'k Sheet, singles	8	0	0	@	8	2	6
Welsh Bars (f.o.b. Wales)	6	7	6	@	6	10	0

Tin.—Purchases still very fair and prices firm. Straits quoted at £99 @ £99. 5/, spot, and £97 for three months futures.

Copper.—Demand is moderately active, and the market closes firm. Merchant Bars quoted at £59, spot, and £59 three months' futures. Best Selected, £66.

Lead.—There has been a larger business, and the market is stronger. Quoted at £14. 10/ for Soft Spanish.

Spelter.—Rather more demand, and the market firmer. Quoted at £25. 2/6 for Ordinary Silesian.

Coal Market.

The Anthracite Coal trade for October falls below expectations, and, although the companies have insisted that prices were maintained, there is reason to believe that Coal has been sold below the schedule officially adopted. In fact, no company agent would admit possessing any personal knowledge of cut prices. At the same time the admission was inadvertently made that "something must be done;" "we must move something." Accordingly, on Tuesday the Anthracite Coal sales agents met and advanced Egg and Stove 10¢, and fixed the November output at 3,250,000 tons, against 3,277,000 tons same month last year. The Western sales agents also met and advanced Chicago prices 10¢ on Egg and Stove. A sharp fall in temperature just now would be a boon.

The situation is just this: The companies have been getting for Egg alongside $4.10 @ $4.15; Stove, $4.30; Chestnut, $3.75 @ $3.80. They will now try and get the October circular, viz.: Egg, $4.20; Stove, $4.45; Chestnut, $4.10, and as nearly as can be judged will realize 10¢ @ 15¢ under these figures, except the last named, which may bring $3.80 @ $3.90. Free Burning Pea is scarce at $2.90 alongside. Buckwheat ranges from $1.80 to $2 alongside.

The menace of a shut down of the gas supply at Pittsburgh, depriving some of the Iron mills of their accustomed fuel, has caused new provision to be made against such a contingency, and excited much conjecture respecting the ultimate effects, as concerns the demand for Coal. Another difficulty threatens in the Connesville Coke region, where the Knights of Labor demand that H. C. Frick shall reinstate certain discharged men. The Anthracite production for the week was 878,792 tons, and for a year past 27,536,640 tons, or 393,878 tons less than at the same time last year.

Soft Coal shipments continue heavy, the figures for the past week being 186,000 tons, exclusive of the Chespeake and Ohio, not reported.

The New Jersey Central Railroad Company are reported to have made a big purchase of land and water front at Elizabethport owned and formerly operated by the Delaware and Lackawanna Company. The Central Company, it is asserted, propose to resume coal shipping on an extensive scale and will put the docks in first-class condition. The price paid by the Central for the property is said to be $250,000.

The receipts of Coal in Boston this year have been 1,404,054 tons of Anthracite and 788,734 tons of Bituminous, against 1,351,980 tons of Anthracite and 794,136 tons of Bituminous last year.

The second of the new seagoing iron hull tugboats, recently launched from the shipyards of John H. Dialogue & Son, was given a trial trip on Saturday, and developed a working speed of over 14 knots. These boats have been built expressly to tow barges carrying Pocahontas Coal from Lambert's Point, Norfolk, Va., to New York and New England. Each tug is expected to pull two or three loaded barges of 1500 to 2000 tons capacity each.

A. A. Douglass, of Mauch Chunk, Pa., one of the oldest pioneer Coal operators in that region, died on the 25th inst., aged 70 years.

Imports.

Hardware, Machinery, &c.

Barbour Bros. & Co., Mach'y, cs., 8
Boker, Hermann & Co., Arms, cs., 31; Mdse, cs., 10
Curley, J. & Bro., Cutlery, cs., 4
Dressler, Oscar & Co., Mach'y, cs., 7
Field, Alfred & Co., Guns and Caps, cs., 13
Folsom, H. & D. Arms Co., Arms, cs., 6
Hartley & Graham, Arms, cs., 20
Jordan, A. J., Arms, cs., 4
Lau, J. H. & Co., Arms, cs., 14
Meacham Arms Co., Arms, cs., 13
Outerbridge, A. E. & Co., Mach'y, cs., 2
Richard, C. B. & Co., Mach'y, cs., 13
Schoverling, Daly & Gales, Arms, cs., 30
Schwarzenbach, Huber & Co., Mach'y, parts, 17
Sumner, Chas. P. & Co., Mach'y, cse., 1
Ward, Jas. E. & Co., Mach'y, pkgs., 54
Werlemann, H., Arms, cs., 35
Wiebusch & Hilger, Arms, 8
Wyman, Chas. & Co., Arms, cs., 8
Young, E. L., Steel Shoes, 120
Order—Hdwe, cs., 17; Mach'y, cs. and pgs., 22

The decision of the Interstate Commerce Commission in the case of George Rice against the Atchison, Topeka and Santa Fé and Pacific Railroads, involving rates on petroleum and its products from Ohio to California points, as affected by the long and short haul clause of the Interstate Commerce law, was announced at Washington on Monday. The decision is in favor of the rail lines, and maintains the position that under the law they have a right to make lower rates at California water and terminal points on this kind of traffic, to meet the competition of water lines, without reducing their rates to the same level at intermediate points, where no such competition exists.

HARDWARE.

Condition of Trade.

REPORTS from jobbers throughout the country indicate a continuance of the very satisfactory business which has prevailed during the season. Retailers are buying freely, though, of course, in not as large lots as a few months ago. A large business is doing in seasonable goods, and assorted orders for replenishing stocks are referred to as being fair in volume. Many manufacturers, while occupied for the present with orders, are, however, reaching a point when they will be glad to secure others in order to avoid an undue accumulation of goods during the next few months. There have been comparitively few important changes in prices.

Chicago.

(*By Telegraph.*)

The volume of business shows no sign of diminution, but on the contrary appears to beincreasing. Leading jobbers report Monday of this week the heaviest day they have had for a long time in the number of orders booked. Sales are now running largely into Shelf Goods and staple lines of Heavy Hardware are comparatively neglected. This is caused by the weakness in prices of the latter, retail merchants buying only from hand to mouth until they think bottom has been touched or until they are forced by their own trade to lay in stock. Prices generally are unchanged.

Prices.

Wire Nails.—The market for Wire Nails is in an unsettled condition and prices are irregular and depressed. As a general quotation for round lots, at mill, $2.30 may be named, but concessions are made from this figure. The market may be characterized as feverish. Manufacturers are evidently desirous of securing orders, but buyers are holding off. As this is not the season when large orders are usually placed it is a matter of uncertainty as to what the future course of the market will be. It is thought not unlikely that with the very large capacity of the mills prices will settle to a point very near the cost of production.

Chicago, by Telegraph.—Another decline since last week is noted. Manufacturers are selling at $2.35, Chicago, and in some cases even lower rates have been made. Jobbers quote $2.50 for small lots and $2.45 for carload lots, and shade the latter when necessary. The market is badly demoralized and it is hard to tell what the ultimate outcome will be. The cause of the depression is evidently too great capacity for production, which compels prices to drop as soon as the season demand falls.

Cut Nails.—At the meeting of the Eastern manufacturers, held last week, former prices were reaffirmed and quotations are, therefore, the same as have been ruling for the past 30 days. Iron Nails, $1.80 at mill; $1.90 at dock; $2 from store, with 10 cents advance for Steel. The market is steady and has a firm tone. The fact that contracts made at lower prices have been for the most part gotten out of the way will, it is expected, give more regularity to prices than during the past month.

Chicago, by Telegraph.—Manufacturers' prices for Steel Nails have evidently touched bottom, as no further decline took place last week in their quotations. The general sentiment is expressed that rather than go lower, which they say means to sell below cost, they will withdraw from the market. The Wheeling price is $1.70 for ordinary average, but nearby mills have made better figures for Chicago delivery, say $1.85. Jobbers quote $1.90 @ $1.95.

Barb Wire.– The demand continues only moderate and there has been no improvement in the tone of the market, with perhaps a slight weakening. Quotations are on the basis of $3.25 for carload lots at mill, but it is rumored that this price has been shaded.

Chicago, by Telegraph.—Manufacturers are absorbing the carload trade and have latterly had a good business in orders of this character, but at very low prices. Jobbers report a light demand, which they are filling at 2.9 cents for Painted, and 3.5 cents for Galvanized.

Planes.—A meeting of the manufacturers was held on the 24th inst., and an advance of 7½ to 10 per cent. was made in the price of goods, the following being the revised discounts, with an additional 2 per cent for cash in ten days:

	Discount per cent.
Molding	35
Bench, first quality	50
" second "	55

No change was made in the extras given to the trade purchasing in case lots. These revised prices are announced by the Auburn Tool Company, Auburn, N. Y., in the following discount sheet, which refers also to other related goods: Terms, f.o.b., 30 days, with additional discount of 2 per cent. for cash in 10 days from date of shipment:

	Discount per cent.
Fancy Planes, Auburn Tool Company	35
Bench " " " " (with Thistle Irons	50
Bench Planes, New York Tool Company (with Thistle Irons)	55
Bench Planes, apple, box and rosewood	35
Plane Irons, Thistle brand (warranted)	35
Bench Screws	35
Hand "	35
Bench Planes (with English irons)	25
Gauges, Marking, Mortise, Panel and Slitting	60
Coopers' Wood Tools	20
Turned Woodenware	30
Handles, Plane and Saw	30
" Awl, File and Chisel	35
" Auger	30

Fiber Head Mallets, &c.—The following are the prices of the Fiber Head Chisel Handles manufactured by E. C. Stearns & Co., Syracuse, N. Y., the list being subject to a discount of 25 and 10 per cent; terms f.o.b. Syracuse:

Tanged Firmer Chisel Handles.

No. 1, Hickory, assorted sizes, per dozen..$1.40

Socket Firmer Chisel Handles.

No. 2, Hickory, assorted sizes, per dozen..$1.20

Socket Framing Chisel Handles.

No. 3, Hickory, assorted sizes, per dozen..$1.40
Applewood, 10 per cent. extra.

Their Fiber Head Mallets are sold from the following list, which is subject to a discount of 25 per cent., f.o.b. Syracuse:

Fiber Head Mallets.

No. 2, 2 inches in diameter, per dozen....$6.50
No. 2½, 2¼ inches in diameter, per dozen. 7.50
No. 3, 3 inches in diameter, per dozen.... 9.00

Glass.—The meeting of the American Glass Company, held in Chicago last week, resulted in a completion of the organization and election of officers. There were no changes made in prices, these remaining the same on the basis of 80 and 5 per cent. discount for small lots and 80 and 10 per cent. discount in carload lots of 400 boxes. The New York and Western factories are reported as being busy, being unable to fill orders promptly. The prices at which Glass can be bought at factories in the Eastern district, none of which are included in the Glass associations, is stated to be from 80 and 10 and 5 per cent. discount to 80 and 10 and 10 per per cent., according to quantity purchased. It is thought by many that there may be an advance in American Glass that is controlled by the Glass associations after election. There has been no change in prices of French Glass since the passage of the Tariff bill, the price remaining discount 75 and 10 per cent., with an additional 5 per cent. discount when 50 boxes are ordered and taken within a calendar month. There was a meeting held in this city on the 27th inst. by Glass importers. Although the results are not yet made public, it is probable that the price on imported Glass will be advanced in the near future. The effect which the weighing clause in the Tariff bill may have on the price of French Glass is not yet fully determined.

Saws.—Henry Disston & Sons, Philadelphia, as mentioned in our last issue, have recently withdrawn outstanding prices on Billet Webs, Wood Saws, &c., and made the goods subject to the regular discount of 20 per cent. The National Saw Company, 96 and 98 Reade street, New York, have taken similar action, and announce the following net prices, f.o.b. factory:

Woodrough & McParlin's Billet Webs.

	Per doz.
No. 10, Bright	$4.50
No. 10, Clock Spring	4.75
No. 7, Bright	4.25
No. 7, Clock Spring	4.50
No. 12, Bright	4.25
No. 12, Clock Spring	4.50
No. 88, Bright	4.50
No. 3, Rogers	2.75

Woodrough & McParlin's Wood Saws, Complete.

350 x 10, Red	7.00
360 x 10, "	7.25
350 x 7, "	6.50
360 x 7, "	6.75
350 x 88, "	6.75
360 x 88, "	7.00
370 x 10, "	7.00
370 x 7, "	6.50
380 x 10, "	7.25
380 x 7, "	6.75
Common x 3, Red	4.50
" x 3, Plain	4.00

Wheeler, Madden & Clemson Mfg. Company's Billet Webs.

Our Very Best	$4.50
Extra Thin Back	4.50
Standard	4.25
Champion	4 50
Clock Spring, Narrow	4 50
Dunn & Co., No. 0	2.75

Wheeler, Madden & Clemson Mfg. Company's Wood Saws, Complete.

Our Very Best, Red	$9 00
" " Plain	8.50
Handy, Red	8.00
Happy Medium, Red	7.00
" " Plain	6.50
" " " Champion	6.75
" " Red "	7.25
" " " Clock Spring	7.25
No. 100, Red	4.50
No. 0, Dunn & Co., Plain	4.00

Wheeler, Madden & Clemson Mfg. Company's.

	Per pair.
No. 5, Cross-Cut Handles	$0.30
No. 7, " "	.35

Tackle Blocks.—The market in Tackle Blocks is still unsettled, and in substantially the same depressed and unsatisfactory condition as it has been for two or three months. There is a good deal of irregularity in the prices named by different manufacturers, but several leading makers are offering the goods at extremely low prices, so that 70 per cent. discount is a figure obtainable on fair orders, with concessions in some cases.

Imported Goods.—The importers are generally holding stocks on hand at the advanced prices required by the increased duties, being apparently indisposed to offer them at less prices than they can be imported under the new costs. This tends to give the market a regularity it would not otherwise possess, while the importers thus secure for themselves substantial profits on present stocks, instead of sacrificing them for the benefit of the trade. A fair volume of business is referred to as doing, and some good import orders are being received.

The new Wostenholm list is still in preparation, but will, it is expected, soon be issued.

The trade will observe in another column the new list of Hermann, Boker & Co. on Wostenholm's and Wade & Butcher's Razors.

Joseph Rodgers & Sons, Sheffield, for whom F. & W. Clatworthy, 82 Chambers Street, are sole agents for the United States, have issued their revised price list, compiled to cover the new duties. It is a compact and well-arranged pamphlet of 34 pages, covering their large line of Cutlery. It is divided into the following departments: Pen and Pocket Knives, Erasers, Razors, Razor Strops, Common Carvers, Slicers, Common Steels, Common Table Cutlery, Rodgersine Plate, Scissors, Bread Knives, Butcher Knives, Ivory Table Cutlery, Pearl Table Cutlery, Ivory Steels, Pearl Steels, Ivory Carvers, Pearl Carvers, Carvers in Cases, Sundries, &c. A comparison of the present prices of these goods with those which prevailed under the recent tariff shows an uneven advance on the different goods, some having considerably advanced, and on others, especially the better grades, the increased cost being unimportant. In this condition of things it will be advisable for the trade to scrutinize carefully the patterns which they purchase, inasmuch as it may sometimes be to their advantage to order other patterns than those they have heretofore been carrying, The new list is subject to a discount of 15 per cent.

Shovels, Spades, &c.—T. Rowland's Sons, Philadelphia, issue the following list of Shovels, Spades and Scoops, Cleveland pattern, which they for some months have been putting on the market. These goods are similar to those made by Chisholm & Sons and A. M. Ross & Co. The list as given below is subject to a discount of 40 and 5 per cent:

Shovels, Spades and Scoops—Cleveland Pattern.

	Black.	Polished.
No. 2, Cast Steel, Long or D Handle, Square Point Shovels	$14.00	$15.00
No. 3, Cast Steel, Long or D Handle, Square Point Shovels	15.00	16.00
No. 4, Cast Steel, Long or D Handle, Square Point Shovels	16.00	17.00
No. 5, Cast Steel, Long or D Handle, Square Point Shovels	17.00	18.00
No. 6, Cast Steel, Long or D Handle, Square Point Shovels	18.00	19.00
No. 8, Cast Steel, Long or D Handle, Square Point Shovels	20.00	21.00
No. 2, Cast Steel, Long Handle, Round Point Shovels	14.00	15.00
No. 3, Cast Steel, Long Handle, Round Point Shovels	15.00	16.00
No. 2, Cast Steel, D Handle, Round Point Shovels	14.75	15.75
No. 3, Cast Steel, D Handle, Round Point Shovels	15.75	16.75
No. 2, Cast Steel, Long or D Handle Spades	14.20	15.20
No. 3, Cast Steel, Long or D Handle Spades	15.20	16.20

	Black.	Half polished.
No. 1, Cast Steel, D Handle Coal Shovels	$15.75	$16.25
No. 2, Cast Steel, D Handle Coal Shovels	16.75	17.25
No. 3, Cast Steel, D Handle Coal Shovels	18.50	19.00
No. 5, Cast Steel, D Handle Coke Shovels	22.00	22.50

Solid Cast Steel Eastern Pattern Scoops.

	Black.	Half polished.	Full polished.
No. 2, Scoops, D or Long Handle	$14.25	$14.75	$15.25
No. 3, Scoops, D or Long Handle	15.00	15.75	16.25
No. 4, Scoops, D or Long Handle	16.00	16.75	17.25
No. 5, Scoops, D or Long Handle	17.00	17.50	18.25
No. 6, Scoops, D or Long Handle	17.75	18.25	19.25
No. 7, Scoops, D or Long Handle	18.75	19.25	20.25
No. 8, Scoops, D or Long Handle	19.75	20.25	21.25

Solid Cast Steel Western Pattern Scoops.

	Black.	Half polished.	Full polished.
No. 4, Scoops, Long or D Handle	$16.00	$16.75	$17.25
No. 5, Scoops, Long or D Handle	17.00	17.50	18.25
No. 6, Scoops, Long or D Handle	17.75	18.25	19.25
No. 7, Scoops, Long or D Handle	18.75	19.25	20.25
No. 8, Scoops, Long or D Handle	19.75	20.25	21.25
No. 10, Scoops, Long or D Handle	23 00	23.50	24.50

Warner Mfg. Company.—The following are revised quotations on Door Springs, Wire Stretchers, Hangers, Coffee Mills, Dampers, &c., made by the Warner Mfg. Company, Freeport, Ill. Terms 60 days or 2 per cent. discount for cash in 10 days :

Warner No. 1 Door Springs, per gross	$12.00
" 2 " " " "	15.00
" 3 " " " "	18.00
Dean's Wire and Strip Stretchers, per dozen	6.00
Bartlett's Combined Barbed Wire Lifter, Stretcher, Cutter and Staple Puller, per dozen	7.50
Warner Parlor Door Hangers, per set	3.00
Baltzly's Improved Stove Truck, per dozen	78.00
Bunker's Adjustable Stove Back, No. 18, per dozen	4.75
Bunker's Adjustable Change from wood to coal, No. 17, per dozen	15.00

Green's French Burr Coffee Mill.

No. 115	$4.00	No. 200	$2.50
" 120	4.25	" 202	3.25
" 125	4.50	" 204	3.00
" 130	4.75	" 205	2.75
" 135	5.00	" 210	3.50
" 140	5.25	" 215	3.50
" 145	5.50	" 220	....
" 155	6.00	" 225	3.75
" 163	6.50	" 235	4.00
" 165	6.50	" 250	3.50
" 175	7.00	" 275	3.50

Warner Star Damper, discount 45 per cent.
U. S. Dampers, discount 25 per cent.
Warner Stove Lifter, coppered, per gross, $5.
Nickeled, per gross, $8.
Warner Stove Poker, nickeled, $16, discount 25 per cent.

Cordage.—Since our last review another change has been made in Sisal, the price of which has been still further reduced ¼ cent per pound. The following are the revised prices, subject to a discount to the trade of ¼ cent per pound:

Sisal.

Rope, 1¼ inch circum. (7-16 in dia.) and upward	9¾
Raft Rope, made from common Yarn	9¾
12 Thread (⅜ in. dia.)	10¼
6 and 9 Thread (¼ and 5-16 in. dia.)	10¾
6 Thread, Fine (3-16 in. dia.)	11¼
3 Thread, Laid (3-16 in. dia.)	10¼
Hay Rope, Hide Rope, Fish Twine, Spunyarn and Bale Rope	9¼
Hay Rope, Hide Rope and Fish Twine, laid	9¾
Hay Rope, Hide Rope and Fish Twine, fine laid	10¼
Hay Rope, Hide Rope, Fish Twine, Spunyarn and Bale Rope, fine	9¾
Spunyarn, Tarred	8¾
Tarred Lathyarn, single "B" and "C" (common and medium)	8
Tarred Lathyarn, single "D" (fine)	8½
" " " "D D" (extra fine)	9
" " double, laid	10
" " fine double, laid	10½
Tarred Shingleyarns, same grade and prices as Lathyarn	
Paper Cord, common, without oil	10¼
" " fine, without oil	10¾

Miscellaneous.—A reduction has been made in the price of the *Forstner Auger Bit*, manufactured by the Bridgeport Gun Implement Company, Bridgeport, Conn., and 17 Maiden lane, New York, the present price of this Bit being 20 per cent.

The *Marion Harland Coffee Pot*, manufactured by Silver & Co., 56 Warren

street, New York, is sold from the following list, which is subject to a discount of 33⅓ per cent.:

quart size,	4	cups		$ .90
2	"	7	"	1.20
3	"	10	"	1.45
4	"	14	"	1.65

S. H. Paulmier, Madison, N. J., manufacturer of Locks with *Paulmier's Key Fastener* attachment, quotes these goods at the following net prices:

Rim Locks, Iron Trim and Iron Key, per dozen	$2.25
Rim Locks, Brass Trim and Brass Key, per dozen	3.00
Mortise Locks, per dozen	4.00

This attachment is to prevent the key when left in the Lock from working or being thrown out, but when desired, it is stated, can be turned by hand with perfect facility.

The following are the prices of Robbin's *Lever Propelling Sled*, described on page 777 and made by the Gifford Mfg. Company, Watertown, N. Y. It will be observed that this Sled is made in three sizes and with bronze or nickel trimmings. The list is subject to a discount of 33⅓ per cent.:

No. 1,	Bronze	Trimmings	$2.50
No. 2,	"	"	3.00
No. 1,	Nickel	"	3.00
No. 2,	"	"	3 50
No. 3,	"	"	4.00

An Automatic Store.

D. T. MALLETT, NEW HAVEN, CONN.

WE HAVE recently remodeled the interior of our store, and as the arrangement is adapted to narrow buildings, which, in the East especially, are the rule rather than the exception, this description is furnished with the view of affording some suggestions of a method which, while utilizing the space, still permits of easy access to all parts of the shelving without the inconvenience of the salesman being obliged to hold the sample boxes over or on the counter showcases. It has also the further advantage of permitting the salesman to engage the attention of several customers at once, if necessary, as the latter to a considerable extent are willing and often prefer to approach closely to the sampled goods and examine them at their leisure, before making a decision. Our attention has often been called to the fact that two-thirds at least of the time and tact of the salesman is consumed in handing down from the shelves and pointing out to the perspective buyer the endless variety of similar articles differing little in application which form each line of goods carried in the modern style of general retail fancy Hardware shop.

Our store is 18 feet in width and 125 feet long, Fig. 816, with two display windows entirely incased inside with sliding glass partitions, the store door being in the center. On entering the main floor to the right, against the wall, is an upright wall showcase, Fig. 619, 12 feet high and 30 feet long. This case has ten large plate glass doors, mounted on patent sheaves. The back of the case is lined with black flannel, as a relief to the bright surfaces of the goods. The case is divided into 20 classes or lines, separated by the upright divisions inside the case.

First comes a line of Butcher Saws, hung in order according to length, from hooks at the top of the first division. Under these are also hung a line of Cleavers and Choppers and other butcher tools. Below these hooks are arranged to separate and hold an unpacked box of each style of Steel Squares. Plumbs and Levels follow

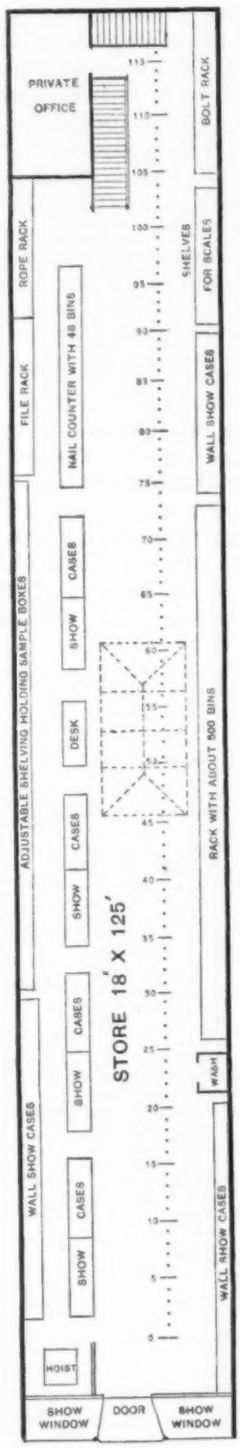


Fig. 816.—D. T. Mallett's Hardware Store, New Haven, Conn.

next, stood on end and inclined backward.

The next division is occupied with a complete line of threes makes of Hand, Back, Compass and Pruning Saws. Each size has a separate hook holding the full contents of a box of each, with a price tag attached to each hook, Fig. 620, showing the kind and price of the article belonging on each. The third division is arranged for Bit Braces, hung in same manner, and also Hatchets of all kinds. This method avoids the misplacing of goods; presents them with the entire sur-

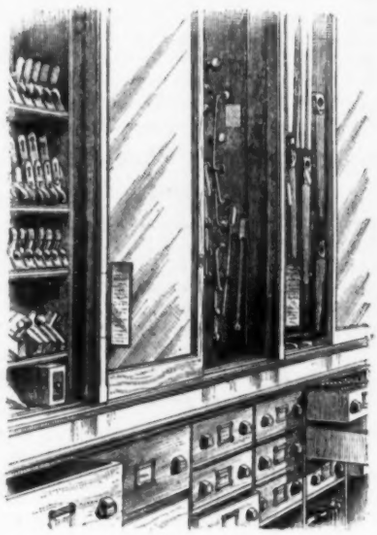


Fig. 619.—Wall Show Case Right of Store.

face to view; allows the customer to know the price without asking, as we have but "one price" in our establishment, which, if not considered low enough by our customers, we either keep the goods or reduce the price to everybody, as we consider one man's money as good as another's, and do not hold to the once prevailing idea that prices should not be plainly displayed, be-

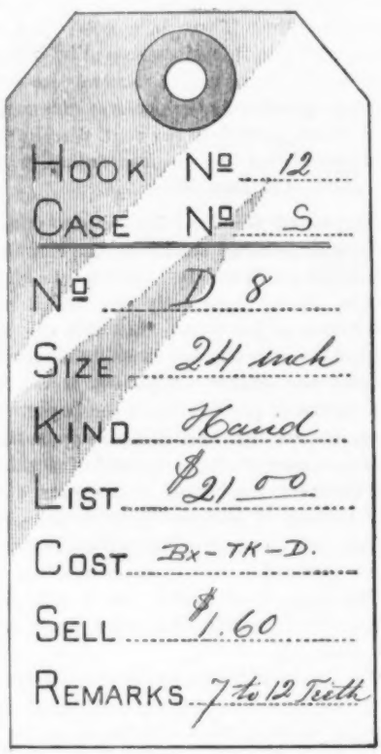


Fig. 620.—Price Tag for Saws.

lieving that a fair price at a legitimate profit to the dealer does not need to blush when brought into the light. The only reduction we make on our regular retail sales is when a certain quantity of goods is

purchased at one time, in which case we have a per cent. discount understood. We find that this method often secures us sales for goods not kept in stock, and focalizes trade. The rest of this wall showcase is used for Iron and Wood Planes, Hammers, Adzes, Carriage Makers' Tools, &c., all arranged with particular attention to their utmost display and convenience in selling.

On the left side of the store is a hoist, with about 3-foot opening in the floor, for

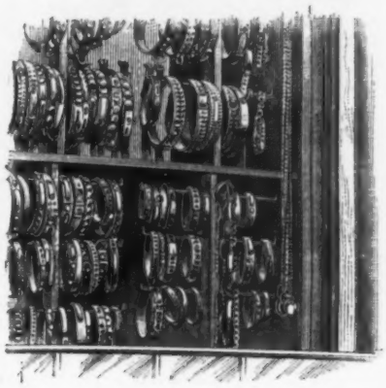


Fig. 621.—Wall Show Case on Left of Store.

lifting heavy barrels or cases from the basement. This hatchway is provided with a weighted drop door, and further protected with a neat railing. Next to this railing is another wall show case, Fig. 621, similar to the one opposite, but only 15 feet long, and contains three divisions. First a line of Dog Collars, which are displayed on racks, made by placing upright rods 5 feet high from top to bottom in a line about 10 inches apart.

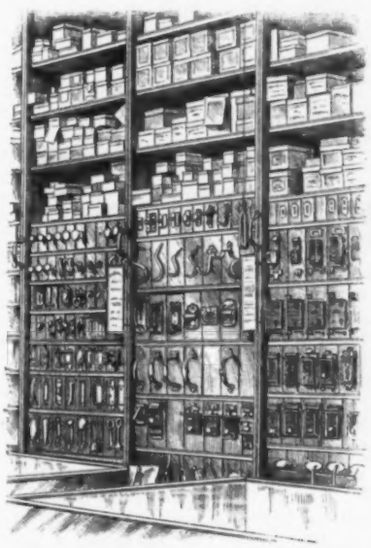


Fig. 622.—Shelving and Show Cases.

Through the upright rods pass short pegs, which project out 4 inches on either side, with a knob on the end. These small pegs are placed one above the other, and at varying distances apart from 3 to 8 inches. On these the Dog Collars when fastened are hung five to a peg, thus making a solid display of shining Collars, any one of which can be had at once without disturbing the stock. The Collars are all tagged with their prices, numbers and length. This arrangement will nicely hold 500 styles of Collars. The second division of this case is used for a line of Fishing Rods, in a vertical position, held in place by wooden pegs, and above them a line of kindred goods. The third and last division is arranged for Tennis Rackets, which are placed on edge in a light rack capable of holding 100 styles, any one of which can be removed without touching the others.

Under both of these wall showcases is a line of drawers, three deep and 150 in

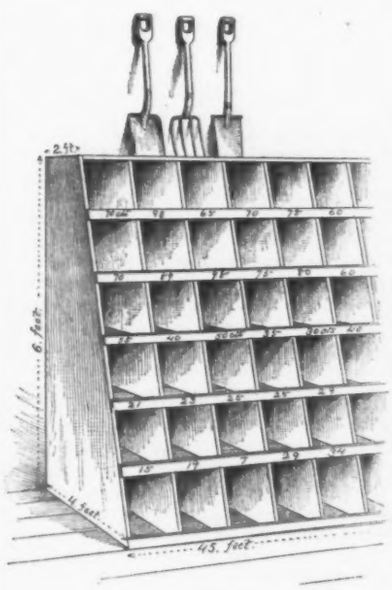


Fig. 624.—Bins for Cheap Tools and Novelties.

number, which are divided to hold complete lines of Chisels, Ship Augers, Car Bits, Saw Webs, Wrenches, Plane Irons, &c. The line of counters starting from the wall showcases run backward for a distance of 60 feet, with frequent spaces between them, Fig. 622, of ample size to allow the customers to approach the shelving. The counters hold flat top show cases of uniform size. They are arranged to display Pocket and Table Cutlery, Fig. 223, Scissors, Machinists' Fine Tools and Sporting Goods. The frames of the cases are cherry, and they are 15 inches deep and 30 inches wide, thus holding a complete line of the goods carried, which are all tagged with the prices.

On one side of the store against the wall, and occupying 45 feet of space, is an inclined rack of 500 shallow bins 6 feet high, Fig. 624. The bins each measure about 12 x 6 inches, and are used to dis-

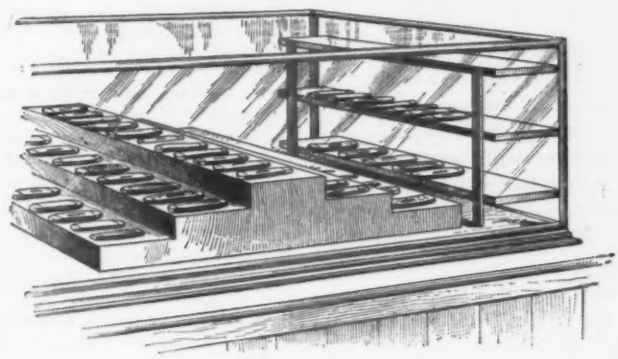


Fig. 623.—Display of Pocket Cutlery.

play a line of cheap Tools and Novelties, and are ticketed with the name, use and price of the various small wares they contain. This is a sort of Bargain Rack and seldom fails to attract the attention and nickels of the customers. Near the center of the store is a charge desk, allowing a full view from its position of all parts of the store. Above the desk is a large skylight. Behind this desk is another counter, used for cutting Wire Cloth, &c., and in the extreme rear a private office with windows opening on the rear.

On both sides of the store, running from the wall showcases backward the entire length, is a line of Adjustable Shelving, made in removable sections and trimmed in oak. Under the shelving is a black walnut ledge 12 inches wide, and below this a double line of drawers and one row of bins. Between the drawers is placed a narrow board 3 inches wide, which serves for a step, with which and the aid of brass handles, Fig. 622, on the pilasters of the shelving, goods can be reached on the highest shelf without the use of the unsightly store ladders. For a distance of 4 feet from the ledge upward a line of cherry front shelf boxes is arranged, Fig. 622, in sizes of from 2 to 8 inches, the larger ones being at the bottom, of course. But one row of boxes is on a shelf, and each box is neatly sampled

Fig. 625.—Gilt and Black Signs.

(there is considerable difference in the manner of sampling boxes) with its contents and tagged with the number and price. These boxes number about 1000 and present a very attractive appearance. In each division of the shelving is placed the "overstock" of the goods contained in the sample boxes, thus avoiding misunderstanding or loss of time in finding

stock—a matter of considerable importance in a busy retail store. In addition to the retail prices marked on the sample boxes complete price-lists of uniform size are hung on the pilasters of each division, describing in detail the goods contained in each and list, discount, &c., of each article.

The drawers throughout the store are faced with oak and have brass pulls, and also card frames in the center, holding a printed card showing the contents of each. This detail is especially done to enable the customer to figuratively help himself, and also serves as a guide for the boys in the store. The balance of the shelving is arranged to display Scales, Coffee Mills and other bulky goods. In arranging our Pocket Cutlery, Fig. 623, we have the counter showcase, which is 10 feet long and 15 inches deep, arranged with shelves placed above each other and covered with gold color flannel (as are all our counter showcases). The Knives are then arranged on these narrow shelves according to price, no boxes being used in this arrangement, and the effect produced is a mass of showy Cutlery, which can be selected with ease. We commence with 25-cent Knives, which we mark with white lead with a stylus on the blade near the rivet "A." The 50-cent Knives we mark "B," and so on with the balance of the stock. The position of the Knives shows us the price as well as it does the customer, and if they should become mixed when taken out of the case, the mark on the blade prevents a mistake. We have Folding Knife Boxes bearing our advertisement, in which we put each Knife as sold, also a similar arrangement with Scissors. In arranging all the counter showcases, we dispense with the paper boxes in which the goods are packed by the manufacturers, and find that the effect is more pleasing. On our gas fixtures are suspended gilt and black signs, Fig. 625, about 4 inches wide and 2 feet long, lettered with the names of lines of goods not in sight. From our description it will be noticed that the arrangement enables the customer to become to a certain extent his own salesman.

Trade Items.

WE ARE ADVISED that no change in the business of the David Maydole Hammer Company, Norwich, N. Y., will ensue in consequence of the death of Charles H. Merritt, their president, to which reference was made in our last issue. The company were incorporated last January under the laws of the State of New York. Recent improvements and additions in the plant of the company have been completed and they are now in a position to supply promptly the demands of the trade. They advise us that during the past year they have been several thousand dozen behind their orders at all times, but with the increased facilities above referred to they expect to get abreast of the demand before long.

A COPARTNERSHIP, under the name of the Huron Grindstone Company, was formed September 1, 1890, at Port Austin, Mich., for the manufacture and sale of Grindstone, Building Stone and Scythe Stones. The quarries of this company are adjoining and a part of the deposits of Blue Sandstone from which the Lake Huron stones are quarried, and the deposit is considered as desirable as others in the neighborhood. A Grindstone and Scythe Stone factory is now being erected, but owing to the fact that the rock cannot be perfectly worked during frosty weather, the company will not be able to place goods on the market before May 1, 1891. They will make a specialty of Grindstones suitable for the use of Cutlery manufacturers, as this company have found a rock particularly suitable for this work. They will open a yard and have their headquarters at Port Huron, making that a shipping point, and expect to move their office there about May 1, 1891.

THE ADVERTISEMENT of the New Departure Bell Company, Bristol, Conn., for whom John H. Graham & Co. are agents, 113 Chambers street, New York, page 76, illustrates their 4-inch Distance Bell, some of the features of which are pointed out, and directs attention also to their New Departure Call Bells.

IN THEIR ADVERTISEMENT on page 69 it will be observed that the Goodell Company, Antrim, N. H., for whom Alford & Berkele Company, 77 Chambers street, New York, are agents, call attention to their extensive line of Table Cutlery, Butcher Knives, &c. Their announcement indicates the large variety of these well known goods which they are making.

THE BROOKLYN MALLET AND HANDLE WORKS have removed from their old location, Third Street and Gowanus Canal, Brooklyn, N. Y., to Northport, L. I., and have opened an office and salesroom at 17 Murray Street, New York, where they will carry a complete line of everything manufactured by them. The company have for some time past been much cramped for room, and the removal was made to enable them to handle more satisfactorily their enlarging business, their facilities having increased one-third. The members of the firm are Henry J. Bennert, G. L. Murphey and Willis B. Burt. We are advised that second-growth Long Island hickory is used in making their goods, which are described as finely finished, and the excellence of quality is alluded to as creating a constantly increasing demand for them. The company's specialties are, Mallets of every description, Chisel Handles and Machinists' Handles.

THE BONNEY VISE AND TOOL WORKS Philadelphia, announce an improvement in the construction of the entire line of the Bonney and Champion Amateur Vises. They have succeeded in constructing new patterns, so as to have the screw made in one solid piece, so as to admit of the collar on the screw passing through the front jaw when the rear jaw is off, but when in place it is impossible to force it to come out, thus overcoming, it is stated, a serious objection. The screw is referred to as being made of steel, with no ring or collar to pull off; and they make the point that there is now no danger of twisting off the head of the screw. These changes are alluded to as valuable improvements with no increase in the price of the goods.

THE *Farm Implement News*, in its October issue, gives an extended description of the Farm Machinery and Vehicle business of Staver & Walker, with illustrations of their headquarters and warerooms, Portland, Ore., and their Spokane branch, together with a review of the growth of the Northwest, in which territory the above firm operates. Besides the branch at Spokane Falls, they have branches at Seattle, Walla Walla, Pomeroy and Colfax, Wash.; Moscow, Idaho; La Grande and Medford, Ore., and have an extensive system of agencies throughout Oregon, Washington, Idaho, Western Montana, Northern California, British Columbia and Alaska, with a corps of salesmen constantly on the road.

AN ADVERTISING NOVELTY that is being offered the trade by the Ætna Boot and Shoe Hardware Company, Unionville, Conn., is a Check Cutter and Desk Rule made of sheet metal and struck up so as to avoid the flatness that ordinarily pertains to articles of its class. It is in the form of a square, with indications of inches and fractions along the longer arm. It is a brass color on the inside, and enameled in salmon color and other shades on the outer or upper side. Upon the latter also is printed advertising matter appropriate to the place. It is something which most receivers put in use upon their desks, and accordingly an advertising novelty which many will find abundant use for.

JOHN MCKILLOP, who has for many years been in charge of the Chicago branch of the mercantile agency of John W. Ealy & Co., has engaged in business on his own account as a mercantile collector. Mr. McKillop has opened an office in room 616, United States Express Building, Chicago, and will devote his especial attention to accounts in connection with the iron trade, hardware business, stove trade and associated lines. Mr. McKillop's experience has been extensive and he has an extremely wide acquaintance in the trades to which he proposes to devote his energies.

Competition No. 4.

THE COMMITTEE of Award in this competition on the subject of Good Buying, after a careful examination of the different papers, have made the following award of prizes: First prize to Fred. Macey, Grand Rapids, Mich., and the second prize to C. T. Rosenthal, Batesville, Ark. Both of these papers are of especial merit and contain suggestions in regard to purchasing goods and the conduct of business. with descriptions of approved methods, which cannot fail to be of much interest to the trade. We desire also to thank the other contributors for their papers, which contain much of interest and value.

Price-Lists, &c.

THE Norton Emery Wheel Company, Worcester, Mass., issue an illustrated price-list of Dry Rubbing and Sharpening Stones, on which no oil or water is necessary. These are made in Round, Triangular and Square Emery Sticks; Gouge, Slip, Dry Rubbing and Sharpening Stones, in many widths and lengths. These are referred to as having a rapidly growing demand and as being of interest to all classes of wood workers, stone and marble workers and machinists, as they are adapted to a great variety of uses.

W. B. Belknap & Co., Louisville, Ky., wholesale dealers in Hardware, Cutlery, Ammunition, Cartridges, Gun Goods, &c., issue a fall trade circular of season goods, with special net prices. The illustrations show Corn Shellers, Corn Huskers, Scoops, Traps, Door Hangers, Coal Vases, Coal Hods, Dog Irons, Wringers, Coffee and Spice Mills, Meat Cutters, Butcher Knives, Measuring Faucets, &c., &c. On the first page of the cover is an index to the articles contained in the circular, which will prove of great convenience. The arrangement of the circular is commendable, and the feature of giving special net prices is worthy of attention.

Simpson, Hall, Miller & Co., Wallingford, Conn., New York, Chicago and Montreal, Canada, manufacturers of Electro Plated Ware, issue a catalogue for 1891. This is 9 x 13 inches, containing over 430 pages, bound in cloth and profusely illustrated. The designs presented are artistic, covering a large line of Tea Sets, Casters, Dishes, Candelabra, novelties in Cigar Boxes, Pepper Boxes, &c.; also Flat Ware and Steel Knives. Those interested in this class of goods will appreciate this catalogue, which is exceptionally complete.

The Lufkin Rule Company, Cleveland, Ohio, issue an illustrated catalogue and price-list for 1890–91. This includes Steel Rules and Tapes, Steel Board Rules, Hickory Board and Log Rules, Boot Calks and Sets, Perfection Glass Boards and miscellaneous specialties for lumbermen. They state that there have been a few changes in their lists in this catalogue and suggest the destroying of previous lists, depending only on the latest for prices. The catalogue presents their well known line of goods in convenient form, with their recent additions.

Wilcox & Howe., Birmingham, Conn., manufacturers of Carriage Hardware, have issued a supplement to their catalogue. This relates to Steps of various designs, Carriage Step Plates, Reach Sockets in parts, Half Top Joints, Body Loops, Yokes and Braces, Phaeton Reach Plates, Slat Irons, Finish Canopy Top Irons, Improved Shifting Rails, Brewster Gear Irons in sets, &c. They state that particular attention is paid to the export trade, which with them has shown a very gratifying increase this year, and that they are shipping their goods to all parts of the world.

E. T. Barnum, Detroit, Mich., manufacturer of Ornamental Wire Work and Iron Work, issues a catalogue devoted to the Bostwick Folding Steel Gate made by him. It is stated that the want of an outside guard to doors, windows, vestibules, elevator entrances, stables, &c., which would be a safeguard while in use, that could be removed with ease, without the trouble of unhinging and stowing away, has long been felt. Numerous experiments have resulted in the Bostwick Folding and Extension Gates. These Gates and Guards are made of rolled refined Channel Steel, but for particularly fine work can be made of brass or bronze, and can be nickel plated or electro bronzed upon Steel. The point is made that a gate 10 feet in width can be folded in the space of 15 inches, and turned aside out of the way, and may be operated as easily as any ordinary swing door. The ornamentation on the top of these gates is of various designs; for opera houses, theatres, &c , may be made with tramway, without stiffening bar or track.

The special bathtub catalogue of the Standard Mfg. Company, Pittsburgh, Pa., is an elegant publication that will rank with the best specimens of trade catalogue work. The catalogue is bound in handsome red heavy paper printed in gold, and is backed with cloth. The size is 12 x 9½ inches, and it contains over 60 pages. The first two pages give interior views of the exhibition rooms of the Standard Mfg. Company, showing very tasteful decorations of rooms and convenient arrangement of handsome fixtures. The company state that their object has been to make a bathtub that would be practically everlasting, always clean and sweet, and they refer to the substantial increase in the demand for Standard porcelain enameled bathtubs as an indication that they have been successful. They refer to the wide veriation in prices of the goods illustrated, but state that the tub itself is the same quality no matter what the price may be, the difference in cost being due to expensive trimmings and settings. As described by the manufacturers, the body of the tub is of cast iron, which, after being molded, is thoroughly pickled and then coated thinly with porcelain in solution, which is dried gradually, leaving a white precipitate on the surface of the iron. By means of intense heat the porcelain is fused and amalgamated with the iron. While at a bright red heat porcelain is applied in a powdered form, which adheres to the heated surface, and after several coatings of this kind the tub is gradually cooled, the finished article being a combination of glass and iron. The pamphlet illustrates an assortment of Standard porcelain enameled baths of different patterns and with different forms of overflow and waste. Also the Aldine pattern, which is a decorated bath with center outlet; then the same pattern plain and decorated with recessed side outlet. A variety of different shapes and combinations follow. At the close of the catalogue illustrations are presented of foot baths, sitz baths, wash trays, &c.

The E. W. Ross Company, Springfield, Ohio, manufacturers of the Ross Cutters, issue a book of over 100 pages devoted to silos and ensilage. The purpose of this book, as stated in the preface, which is their seventh yearly volume on this subject, is to give the widest possible dissemination of silage knowledge in regard to the most advanced and practical silo thought. To this end this volume is a fresh compilation, gathered from original sources of information, and while it treads the same path with other publications of like nature, it embodies facts and points, and, withal, is so concise and practical, that it will be of service to those for whom it is intended.

Razors.

HERMANN BOKER & CO., 101 & 103 Duane street, New York, have issued a new list, dated October 6, on the lines of Wostenholm's and Wade & Butchers' Razors which they are offering to the trade. This list, which is printed below, is subject to a discount of 15 per cent.:

Wostenholm Razors.

Pipe Razors.

No.	Inch.	Per doz.	No.	Inch.	Per doz.
01411	⅝..	$4.50	03492 G	¾..	$11.40
01412	¾..	4.75	03548 G H	⅝..	8.15
01413 M S	¾..	5.00	03745	⅝..	8.65
01461	⅛..	12.90	03746	⅝..	8.50
01461	⅝..	12.90	B. 50	¾..	4.75
01461 B	¾..	13.40	V. 5	⅝..	11.90
01461	⅛..	14.40	V. 5	¾..	12.40
01724	⅝..	7.00	V. 6	⅝..	12.15
02363&H.P.	⅝..	9.75	V. 6	¾..	12.65
02364&H.P.	¾..	11.15	V. 16	⅝..	9.00
03131	⅛..	11.90	V. 20	¾..	9.50
03316 H.P.	⅝..	11.65	V. 23	¾..	11.15

IXL Razors.

No.	Inch.	Per doz.	No.	Inch.	Per doz.
5771	¾..	$9.25	03604	¾..	$5.50
5771½	⅝..	8.75	03608 B G	⅝..	11.15
01442	⅝..	8.75	03609 G	⅝..	8.75
01442 G	⅝..	8.00	03638	⅝..	9.00
01443	⅝..	6.25	03727	⅝..	13.15
01444	⅝..	6.75	V. 1	⅝..	9.25
01444½	⅝..	6.50	V. 9	⅝..	7.50
01457	¾..	7.25	V. 10	⅝..	8.00
01909	⅝..	6.50	V. 12	⅝..	8.00
01914	⅝..	11.15	V. 13	⅝..	11.40
01974	⅝..	11.15	V. 14	⅝..	8.00
01974 Iv'y G	⅝..	18.15	V. 15 Bone	⅝..	8.50
02780	⅝..	8.50	V. 17	¾..	12.15
02784	⅝..	8.40	V. 18	¾..	9.50
03129	¾..	11.40	V. 19	¾..	6 50
03348	⅛..	12.50	V. 21	⅝..	12.15
03494 G	⅝..	8.00	V. 22	⅝..	9.50
03601½	¾..	5.00	V. 24	⅝..	9.00

Pipe Blanks.

Stamped on reverse side of Tang. "Sold Unfinished by Geo. Wostenholm & Son."

No.	Inch.	Per doz.	No.	Inch.	Per doz.
02356	⅝..	$5.75	02359	¾..	6.00
02357	⅛..	6.00	02360	⅛..	6.25
02358	⅝..	6.00	02361	1..	6.40

Wade & Butcher Razors.

No.	Inch.	Per doz.	No.	Inch.	Per doz.
15 Special	⅝..	$12.90	901	⅝..	$5.40
15 "	¾..	13.65	984	⅝..	4.50
600	¾..	4.50	984 H. P.	⅝..	4.65
601	¾..	4.65	984½	⅝..	4.75
610	¾..	5.25	984½ Stag	⅝..	5.50
621	¾..	5.65	992	⅝..	8.25
628 G	¾..	5.65	1180	⅝..	7.50
633	¾..	5.75	1180 Bone	⅝..	8.15
636 G	¾..	5.65	1188	⅝..	10.00
650	¾..	7.65	1210	⅝..	8.00
744 H. P.	⅝..	6.40	1281 H. P.	⅝..	7.25
750	¾..	8.15	1330	¾..	9.25
751	¾..	8.15	1336 Etch'd	⅝..	13.40
753	¾..	8.00	1336½	⅝..	12.40
754	¾..	8.00	1367	⅝..	8.40
757	⅛..	7.50	1367 Clear	⅝..	8.15
758	⅛..	7.50	1372	⅝..	6.90
758½	⅛..	7.75	1395	⅝..	13.50
760	¾..	8.50	1395	¾..	14.00
763 H. P.	⅛..	9.65	1398	¾..	8.25
771 G. T.	⅝..	8.25	1399	¾..	8.25
777	⅛..	9.50	1463	¾..	5.25
787	1..	12.50	1469	⅝..	13.90
829 Ivory	⅝..	17.00	1475	¾..	7.65
830 "	⅛..	17.00	1476 Mustache	..	6.90
840 & H. P.	⅛..	10.00	1499	¾..	5.15
841 & H. P.	⅛..	10.00	1502 Bone	⅝..	6.40
842 & H. P.	⅛..	10.00	1502 Black	⅝..	6.00
843 & H. P.	⅛..	11.75	1534	¾..	7.00
844 & H. P.	⅛..	11.25	1537	¾..	8.15
845 & H. P.	⅛..	12.00	1538	¾..	8.50
846 & H. P.	¾..	10.00	1547 Cel'd	¾..	9.40
847 & H. P.	¾..	12.15	1582	⅝..	6.50
860 Bone	⅝..	5.90	V. 571	⅝..	8.90
860½ B Etc'd	⅝..	6.00	0944 Ivory	¾..	21.75

Wade & Butcher's Famous Keen Shaving Bow Razors.

No.	Inch.	Per doz.	No.	Inch.	Per doz.
100 Etched	⅝..	$8.65	103 Plain	⅝..	$11.25
101 "	¾..	9.00	106 "	⅝..	11.75
101 Stag	¾..	9.15	107 "	¾..	12.25
102 Etched	⅞..	9.50	108 "	⅞..	13.00

Bow Blanks.—Stamped on front of Tang with Bow only.

No.	Inch.	Per doz.	No.	Inch.	Per doz.
109	⅝..	$5.50	112	¾..	$5.65
110	⅞..	5.50	113	⅞..	5.75
111	⅝.	5.50			

Wade & Butcher's Razors for Hollow Grinding.

No.		Inch.	Per doz.
2859	Black and Polished Tang,	⅛.....	$5.65
2859	" " "	⅛.....	5.65
2859	" " "	⅛.....	5.75
2859	" " "	⅛.....	5.75
2859	" " "	1.....	6.40

Bengall Blanks.

Width, inch.....	⅜	½	⅝
No. 4870, per doz.....	$6.50	6.50	6.50
No. 3861, "	6.25	6.25	6.25
Width, inch	¾	⅞	1
No. 4870, per doz.....	$6.75	7.00	7.50
No. 3861, "	6.50	6.75	7.25

Bengall Razors.—Extra Hamburg Hollow Ground.

Width, inch.....	½	⅝	¾
No. 4870, per doz.....	$12.10	12.10	12.35
Width, inch.....	⅞	1	
No. 4870, "	12.85	13.10	

Exports.

PER STEAMSHIP KARLSRUHE, OCTOBER 9, 1890, FOR SYDNEY, AUSTRALIA.

By F. B. Wheeler Co.—24 dozen Knives, 20 dozen Wringers, 3 cases Hardware, 6½ dozen Brushes, 25 dozen Axes, 4 dozen Wringers.
By R. W. Cameron & Co.—1 barrel Lampware, 5 cases Sledges, 1 box Belting.
By W. E. Peck.—7 cases Hardware.
By McLean Bros. & Rigg.—3 dozen Harrows, 3 dozen Carpet Sweepers, 2 dozen Lemon Squeezers.
By Arnold, Cheney & Co.—4 packages Hardware.
By Wm. Lupton.—18 cases Hardware.
By A. Field & Sons.—7262 pounds Iron Nails, 16 boxes Iron Nails.
By Collins & Co.—39 dozen Axes.
By R. H. Dana & Co.—6 cases Pipe Wrenches, 1 case Picture Cord, 7 cases Corn Shellers, 1 case Feed Cutters.
By S. Guiterman & Co.—11 cases Hardware.
By J. L. Mott Iron Works.—9302 pounds Iron Stoves.
By Strong & Trowbridge.—6 dozen Cow Bells, 1 dozen Chucks, 2 dozen Reflectors, 1 dozen Locks, 29 pounds Carriage Hardware, 22 Pumps, 15 dozen Rattlers, 3 dozen Rakes, 2500 Bolts, 2 dozen Picks, 3 dozen Hatchets, 165 pounds Hardware, 4 packages Lampware, 250 pounds Hardware, 3 dozen Glue,

5000 feet Belting, 205 pounds Hardware, 1 case Punches, 2 Corn Shellers.

By W. H. Crossman & Bro.—1297 pounds Nails, 2 gross Egg Beaters, 1 gross Wringers, 31 dozen Fish Lines, 560 pounds Nails, 200 dozen Tacks, 3 gross Cow Bells, 13 dozen Chisels, 8000 Cartridges, 15 boxes Carpenters' Tools, 8 cases Hardware, 2 gross Traps, 6 dozen Mattocks, 3 packages Lamp Goods, 5 dozen Pot Hooks, 3 dozen Traps, 11 packages Hardware, 6 dozen Stocks and Dies, 1½ dozen Jacks, 1 dozen Barrow parts, 2000 Bolts, 20 dozen Axes, 1 dozen Air Pistols and Targets, 12 packages and 13 cases Hardware, 3 gross Air Gun Ammunition, 4 dozen Lamps, 25 cases Hardware, 1 case Hog Rings and Ringers, 6 Scales, 4 cases and 1 hogshead Pump Parts, 1 case Agricultural Implements, 1 dozen Bench Screws.

By H. W. Peabody & Co.—27 cases and 54 packages Hardware, 3 packages Lamp Ware, 20 cases Hardware, 24 Churns, 150,000 Rivets, 2 cases Stoves, 10 packages Hardware, 11 packages Lamp Ware, 128 packages Hardware, 63 Churns, 3 cases Cartridge Shells, 2 cases Lining Nails, 2 gross Faucets, 1 gross Rat Traps, 33 packages Hardware, 9 packages Hardware, 25 packages Plows, &c., 15 cases Corn Shellers, 1300 pounds Horse Nails, 5 packages Windmill and Parts, 100 pounds Nails, 1 package Hardware, 1 case Drills.

FOR MELBOURNE.

By Mailler & Quereau.—12 packages Wire Goods.

By McLean Bros. & Rigg.—3 dozen Bench Stops, 1 dozen Scales, 12 dozen Dog Collars, 1 case Harrow Parts, 9 sets Cultivator Teeth, 650 feet Rubber Hose, 2 dozen Pistols, 5 dozen Locks, 1 case Plow Parts, 11 dozen Razor Strops.

By R. W. Cameron & Co.—6 dozen Scoops, 1 box Hardware.

By L. Gershel & Bro.—50 Air Guns.

By Strong & Trowbridge.—49 dozen Lampware, 24 dozen Tacks, 4 Rifles, 3 Revolvers.

By Gutta Percha and Rubber Mfg. Company.—886 pounds Rubber Hose.

By H. B. Moore.—14 packages Agricultural Machinery.

By R. H. Dana & Co.—13 cases Die Plates, 1 case Hardware.

By W. E. Peck.—5 cases Saddlery Hardware.

By W. H. Crossman & Bro.—12 gross Pencils, 1½ dozen Call Bells, 76 Mowers, 1 gross Traps, 12 cases Hardware, 1 case Lamp Goods, 3 gross Lead Pencils, 1 dozen Cork Pullers, 9 cases Hardware, ½ dozen Scales, 880 pounds Bolts, 3 cases Agricultural Implements, 3 cases Hardware, 52 packages Pump Parts, ½ dozen Vises, 2 gross Glue, 2 cases Hardware.

By W. B. Peabody.—40 cases Hardware, 12 cases Grindstones, 1 case Axles, 5000 pounds Nails, 58 packages Lawn Mowers, 1 case Hardware, 16 cases Hoes and Plows, 38 cases Skewers, 600 reels Barb Wire, 12 dozen Shovel Handles, 21 cases Hardware, 39 dozen Spades, 2 packages Pumps, 1 case Cartridge Cases, 995 pounds Bolts, 4 dozen Wringers, 22,400 pounds Barb Wire, 9 cases Meat Choppers, 29 packages Hardware, 8 packages Lampware, 2 dozen Hoes, 5 cases Carriage Hardware, 5 cases Axles, 2 cases Drills, 40 cases Hardware, 4000 Cartridges, 80 cases Bush Hooks, 1 case Razors, 3 packages Harrows.

FOR ADELAIDE.

By Mailler & Quereau.—5 gross Coat and Hat Hooks.

By Arkell & Douglas.—63 gross Iron Toys.

By F. B. Wheeler & Co.—3 cases Rubber Goods.

By Collins & Co.—80 dozen Handled Axes.

By Fairbanks & Co.—5809 pounds Scales.

By R. H. Dana & Co.—28 dozen Axes, 3 dozen Hay Knives, 3 dozen Scoops, 6 reams Flint Paper, 5 cases Hardware, 12 cases Bolts.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

The market has presented few new features the past week. No important changes in prices have taken place, and there is very little in the present situation indicative of any movement that way, apart from revisions on certain specialties in keeping with those already made by some manufacturers. Crude materials, such as Pig Lead, Zinc, &c., are still in a position that serves, in connection with the high cost of chief products thereof, and of Linseed Oil, Spirits Turpentine and various lines of Colors, to keep values decidedly firm on the general line of Paints. Business has been of very fair volume, and in some instances rather heavier than during the preceding week.

White Lead.—No changes in the manufacturers' prices of either the pure pigment or low grade Leads have taken place the past week. All varieties appear to be on a parity with the present cost of materials, or as near to it as competition will admit, and the market shows fairly good tone. Sales are not heavy, by any means, yet there is a fairly good distribution for the season. About the only irregularity is the continued departure from the lines of the corroders' list for pure pigment by jobbers.

Red Lead and Litharge.—There is about the routine movement of these goods, with the bulk of it from first hands direct, and at full list prices.

Zincs.—The position of the market for American Oxide is decidedly strong and the recent advance in prices is maintained all along the line. Crude material is represented as still being in moderate supply, and the deliveries of the manufactured article are said to run very evenly with the current output. The New Jersey Zinc Company have already sold one-third of the next year's product. Foreign brands are selling fairly and remain firm at the prices that have ruled for some time past.

Colors, &c.—The market for the general line of house painters' and grinders' Colors remains firm, with prices practically the same as quoted heretofore and the demand steady. Ready mixed Paints are moving very fairly. Chalk, Whiting, Paris White, &c., are without change.

Oils and Turpentine.

The condition of the market for the general line of Animal and Vegetable Oils is practically the same as it was a week ago. Values have in no case shown any tendency toward a lower range, and while slight improvements may be noted in a few instances, the actual changes are unimportant except in point of reflecting a very steady market. The movement of supplies has been of merely routine type, as a rule, yet chiefly in line with what is usual at this season of the year. Turpentine prices have weakened somewhat under the influence of heavier supplies.

Linseed Oil.—City brands are still quoted at 62¢ for domestic and 64¢ for Calcutta seed product. Manufacturers report a steady distribution and manifest no alarm over reports current of freer offerings of outside brands at 59¢, delivered here. The city made Oil, in fact, seems still to be given the preference by most buyers at the difference in price.

Cotton Seed Oil.—The receipts of crude at this point are still chiefly low grades, and the offerings of refined mainly quality below standard. The demand, while not particularly brisk, has shown some improvement, and prices are rather firmer. A quality of crude that went at 23½¢ @ 24¢ early in the week has since been sold at 25¢ @ 25½¢, and strictly choice brought 28¢ a few days ago. The refined products have moved chiefly at old prices.

Lard Oil.—In the absence of any radical change in the market for crude material, prices for Lard Oil have remained unchanged, and the market is rather quiet. Neither local nor outside brands, however, are urgently offered.

Fish Oils.—In this line the most interesting feature has been the sale of about 4000 barrels crude Menhaden Oil for home use at practically former prices. An additional 50 barrels crude Sperm Oil has been sold at 71¢ in New Bedford, showing a very firm market for that article. The manufactured Oils are jobbing fairly at old prices.

Miscellaneous.—There have been no important changes in price of Olive, Cocoanut or Palm Oils, and none but ordinary movement of the goods.

Spirits Turpentine.—A gradual increase in the accumulation here has been going on until now about 1500 barrels are in first hands. This addition to the supply, along with slow demand, gives the market a weak appearance; 40½¢ @ 41¢ is now quoted.

CONTENTS.

Fiber Head Mallets.

E. C. Stearns & Co., Syracuse, N. Y., are introducing a fiber head mallet, as illustrated in Figs. 1 and 2. The wood used in the body and handle is referred to as being thoroughly kiln dried. The bands

Fig. 1.—Fiber Head Mallets.

are malleable iron, and the heads can be replaced. The heads of the mallets are tipped with a layer of vulcanized fiber. This fiber is described as being a vegetable compound, which, by means of chemical processes and being subjected to a pressure of 200 tons, is changed to a solid. The claim is made by the manufacturers that this material is tough, elastic, practically

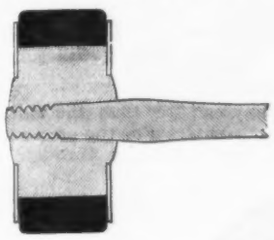
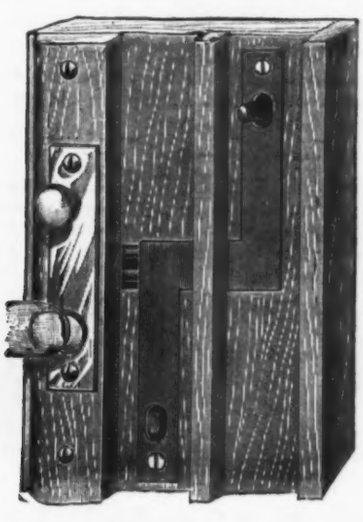


Fig. 2.—Section View of a Fiber Head Mallet.

indestructible, and that a mallet reinforced with this material will outwear ten ordinary ones. Fig. 2 shows the manner that the handle is secured in the mallet and the thickness of fiber used in the heads.

Burglar Proof Sash Locks and Ventilators.

In the description of the above named sash locks and ventilators given in our issue of October 9, Fig. 2 was an illustration of the Economy sash lock. We herewith present the proper cut of the Perfection sash lock, as was intended, being the same as shown in Fig. 3, but having the stop



Perfection Sash Lock and Ventilator.

in place. As will be remembered from the description given in the issue referred to, these locks are adapted to windows with or without weights, and the manufacturers state that they know of no condition in which a sash is used which these locks do not fully and completely provide for. In this lock the knobs are not attached to the levers, and consequently admit of being locked and unlocked, as shown in Fig. 3, October 9 issue.

Improvements in Screws.

Since receiving their patent, August 19, 1890, on gimlet pointed, rolled or swaged wood screws, the American Screw Company, Providence, R. I., have obtained a patent, October 21, 1890, on the spur

Fig. 1.—Spur-Pointed Wood Screw.

pointed wood screw, which is represented in the accompanying illustration, Fig. 1. The claim covering their rolled or swaged screw was finally granted in its original form in the following terms: "A screw having a solid thread raised from the body of the blank by rolling it between dies which compress laterally the metal to form the thread, and force it to expand radially from the blank into grooves in the die, having a form transversely the counterpart of that to be given to the thread." The spur pointed screw covered by the last patent introduces some interesting new features, and for the purpose of comparing it with the rolled or swaged screw an illustration of this is also given, Fig. 2. The difference between these two screws can be obviously seen, the chief variations being in the point, the thread and the shank. The swaged or rolled screw, Fig. 2, has, it will be seen, a gimlet point, single thread and straight shank, while the spur pointed screw, Fig. 1, has spur point, double thread and taper shank. The fact is specially emphasized that the spur pointed screw can be inserted and withdrawn twice as fast as the other, while it has a strong point permitting it to be started with a hammer. The practice of driving a screw in part or wholly with a hammer has grown to be very general, and the spur pointed screw and the Rogers drive screw have been devised to harmonize with this custom. It is obvious that the holding power of a screw depends almost entirely upon the way in which it is inserted, and the ordinary screw driven

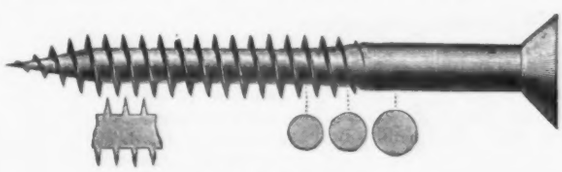


Fig. 2.—Rolled Wood Screw.

its entire length with a hammer has comparatively little hold. The company point out, however, that a Rogers drive screw inserted with a hammer and turning its entire length will hold more than a gimlet pointed screw, as ordinarily inserted.

The company are starting their New England mill, which has been idle for some years, on the manufacture of swaging and rolling spur pointed and Rogers drive screws from foreign material, and under the drawback of 99 per cent. in the McKinley bill advise us that they can advantageously send these screws to foreign markets. It may be added that the screws are to be made of a new homogeneous material, which is especially desirable for screws and peculiarly suited to the swaging or rolling process.

Lever Propelling Sled.

The Gifford Mfg. Company, Watertown, N. Y., are introducing Bobbin's Lever Propelling Sled, as illustrated herewith. The hand piece of the propelling device is hinged to two arms. The front arm is hinged at the lower end to the forward part of the runner, while the lower end of the rear arm is left free, and on the end has a spur of tempered steel which engages itself in the snow or ice when in use. Both arms pass between the sled and nave. The arrangements for propelling the sled are the same on both sides. It is propelled by a motion similar to that of rowing. With a short stroke with the hands a long stroke is produced with the levers, and it is stated that because of the great purchase power the sled runs very easily and will make fine speed on snow or ice. It may be guided in going down hill, as

Lever Propelling Sled.

by grasping the levers below the hand piece they may be used for steering or as a brake to stop the sled. It is referred to as being a valuable substitute for bicycles when snow or ice prevents the use of the wheel. It is made of second growth white ash or oak and finished in the natural wood. The trimmings are finished in nickel or bronze. The hand pieces and seat are cherry color. No. 1 is suitable for children from 5 to 12 years; No. 2 from 10 to 15 years; No. 3 for adults. The point is made that the exercise is such as every boy and girl should have. Prices of this sled will be found in the Trade Report of this issue. The sled is put on the market in confidence that from its novelty and intrinsic merit it will meet with a large demand.

A cargo of gun cotton for the use of the Russian Government was sent from a French Government powder factory to a Russian port, indicating the close relationship of the two powers.

Improved Bung Spout.

E. R. Saxton, Buffalo, N. Y., is manufacturing a bung spout, as illustrated herewith. Fig. 1 shows the manner of using, it being designed to draw liquids of all kinds from the bungholes of barrels without disturbing the sediment. This plan is alluded to as preferable to and more convenient than pumps or faucets, and leaves the barrel in condition for refilling. The spout is referred to as being securely held in position by the clamp and thumb screw and as being strongly made of malleable iron, with rubber packing. The metal is tinned, and the spout is guaranteed not to break or corrode. Fig. 2 shows the spout detached from the barrel.

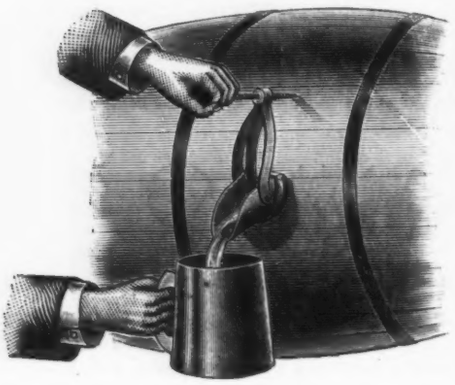
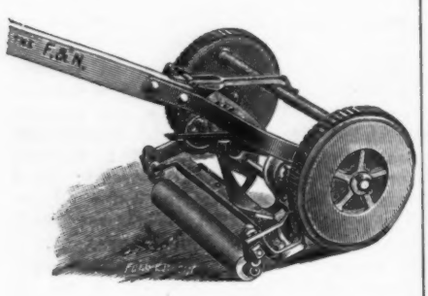


Fig. 1.—Improved Bung Spout.

Fig. 2.—Bung Spout Detached.

F. and N. Lawn Mower.

The F. & N. Lawn Mower Company, Richmond, Ind., are introducing the F. & N. Lawn Mower, as illustrated herewith. The traction wheels are 8¼ inches high, and the mowers are made in 12, 14, 16, 18 and 20 inches cut. The handle braces are pivoted on the center of the traction wheels, to allow it to swing freely up and down, as desired; designed to enable the operator to run the machine over a bank, ridge or across a depression without the necessity of raising or lowering the handle. The ratchet is referred to as a new device. It is completely housed, to prevent dirt or grass getting in to obstruct its working. As will be seen by the cut, a malleable hook is pivoted to the lower end of the handle, and is alluded to as effectually preventing the back of the mower from rising up while cutting heavy grass, or that which is mixed with dead grass and leaves. When in use in ordinary grass the hook is laid back on the handle, when, it is stated, the mower will adjust itself to any uneven surface it passes over. When necessary the hook may be instantly replaced on the cross rod, to do which the operator is instructed to make a quick forward motion with the handle, and the point is made that the machine may thus be held down rigidly to the extra work required of it.



F. & N. Lawn Mower.

Excelsior Baking and Roasting Pan.

M. F. Koenig & Co., Hazleton, Pa., are manufacturing Munson's Excelsior Baking and Roasting Pan, as illustrated herewith. The points of excellence referred to are that the simplicity of construction enables the user of the pans to adjust and handle them readily; that they are durable and easily cleaned; that the wire shoes on the bottom prevent burning the contents, and allow a free circulation of heat in the oven under the pan, and that the catch is an improvement worthy of attention. The manufacturers state that the pans are made of polished steel, similar in appearance to Russia iron, but more durable. The roasters are made in six sizes, from 10 to 19 inches long and of proportional width and depth.

Excelsior Baking and Roasting Pan.

Patent Chimney and Cap.

By means of the illustrations presented herewith we show a patent chimney and cap which have been brought out under the Hodel patent by the Joseph Bell Stove Company, of Wheeling, W. Va. The chimney piece, which is illustrated in Fig. 1 of the engravings, is in the nature of a substitute for brickwork, while the cap shown in Fig. 2 is intended to be placed on the top of ordinary brick chimneys as a finish. Both chimney and cap are constructed upon the same principles, their special purposes being to prevent down drafts, as well as to insure greater safety from fires, while obviating the necessity of repairs to chimney tops. In order to prevent down drafts the tops are provided with oval openings having projecting collars and a heavy cover. The construction is such that no matter what the direction of the wind which strikes against the openings, the escape is always more ready and free than the entrance of the air currents. For the purpose of preventing sparks working through, the devices are lined in their lower portion with a second thickness having an air space, and all joints are lapped.

Patent Chimney and Cap.—Fig. 1.—The Hodel Patent Chimney.

Lieut. B. A. Fiske, U. S. N., advocates the formation of a corps of, say, 250 members, to be drilled as electricians for service in the army and navy, to meet any possible demand for officers to handle electric apparatus connected with ships, guns, search lights, mines, torpedo boats, &c., which are largely controlled by this new agent.

Fig. 2.—The Hodel Anti-Smoking Chimney Cap.

Parlor Lamps.

The Standard Lighting Company, Cleveland, Ohio, whose neat little illustrated catalogue we noticed recently, are putting on the market an extensive line of parlor and house lamps, some designs of which we illustrate in the accompanying engravings. Figs. 1 and 2 show two very attractive parlor cast metal vase lamps, while Fig. 3 is a metal banquet lamp, the general design and finish of which are shown in the illustration. These lamps are fitted with the Standard Lighting Company's No. 3 Globe Incandescent Center Draft Burners. The special advantages claimed for these burners are that they accomplish a perfect combustion of the oil, and that the wick can be turned low without giving off a disagreeable odor. The wick raising apparatus is operated by a vertical screw, shown in the different cuts. This, it is said, raises the wick quickly, and permits it to be easily gauged, so that the flame is not turned too high or too low, the result being in the former case a smoky chimney, and in the latter case accidentally extinguishing the lamp. The company specially direct attention to the fact that these cast metal lamps are sold at a price that appeals to the general trade.

Parlor Lamps.—Fig. 1.—Parlor Lamp No. 971.

In addition to this extensive line of lamps, of which many other designs are presented in the catalogue, the Standard Lighting Company also make their No. 2 lamp of 320 candle power.

The elevated tracks for the Pennsylvania Railroad in Jersey City, will be in running order before Christmas. The work is on a scale of no common magnitude. The southern half of the structure is now about complete. This carries two tracks to the ferry. The iron structure is the heaviest ever made for an elevated railroad of any sort. It is of the usual pattern, consisting of plate girders bolted to uprights. There will be three paralle rows of these uprights, supporting the four-track roadbed under the sides and centre. The iron structure begins at Brunswick street. West of that there is a solid stone embankment broadening into an enormous superficial triangle, the hypothenuse of which is marked by the two through tracks which there bend north and west through Bergen Hill cut.

Fig. 2.—Parlor Lamp No. 972.

Valuable suggestions to American manufacturers respecting the resources of Australia and the practicability of working up a larger trade are made by George Gollen, of Gollen & Co., of Adelaide and Melbourne, who is now in this country. "Machinery of all descriptions," he said, "has a large outlet there, and a large trade is now being done with America, especially in mining and harvesting machinery; still, this might be largely increased. The Australians recognize the importance of all labor saving machinery and are ever ready to take up anything new whereby either time or labor can be saved. The leading brands of American hardware are well known there, and in many lines command a preference over the English and Continental manufactures. The Germans are making a bid for a number of the lines exported by American manufacturers, and if the Americans are desirous of holding their trade they must make themselves more thoroughly acquainted with the requirements and wants of their Australian constituents. All the kerosene used in Australia is shipped from America, and enormous quantities are sent forward every year. American granulated sugar commands a premier position, owing to its excellent manufacture. Enormous quantities of lumber are now being shipped from Puget Sound and other points."

Fig. 3.—Banquet Lamp No. 948.

The republic of Bolivia, hitherto isolated among the nations, is now building a system of railroads that will extend to the frontiers in all directions. The Government of Colombia is similarly exerting itself to open the interior to trade, with the more immediate object of finding an outlet through the headwaters of the Magdalena River. Contracts have been made with a California syndicate.

CURRENT HARDWARE PRICES.

OCTOBER 29, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Adjusters, Blind.

Domestic.....₩ doz $3.00, 33⅓%
Excelsior.....₩ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Ammunition.—

Caps, Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges—
Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting.....15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—
erdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....5%

Shells—
First quality 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Prize.....40&2%
Star, Club, Rival and Climax brands.....33⅓&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.....65&2%

Shells Loaded—
Standard List, July 19, 1890..40&10&5%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up...	68¢
U.M.C.&W. R. A.—B. E., 9&10...	82¢
U.M.C.&W. R. A.—B. E., 8.....	96¢
U.M.C.&W.R.A.—B. E., 7.....	$1.10
U.M.C.&W. R. A.—P. E., 11 up..	1.15
U.M.C.&W. R. A.—P. E., 9&10..	1.50
U.M.C.&W. R. A.—P. E., 8.....	1.70
U.M.C.&W.R.A.—P. E., 7.....	1.80
Eley's B. E., 11 up.....	$1.75
Eley's P. E., 11@20.....	2.80

Dis.30&2

Anvils.—

Eagle Anvils, ₩ ₺ 10¢.....15@15&5%
Peter Wright's.....11½¢
Armitage's Mouse Hole.....10½@11¢
Armitage's Mouse Hole, Extra...12@12½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher,
P. S. & W. Co.
Rockford Bit Company.
} 70&10%

Cook's, Douglass Mfg. Co.....55%
Cook's, N. H. Copper Co.50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32½ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&5%
Snell's Jennings Pattern.....60%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits.....60%
L. Hommodieu Car Bits.....15&10%
Foratner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits....30&10%

Bit Stock Drills—
Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood..40&10%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $26 ₩ doz.35@35&5%
Ives' No. 4, ₩ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Hollow Augers—
Ives.....
French, Swift & Co.....
Douglass'.....
} 33⅓@ 33⅓&10%

Bonney's Adjustable, ₩ doz $48....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common ₩ gr $1.70, 35%
Awls, Should. Peg, ₩ gr $2.45, 40@40&10%
Awls, Pat. Peg, ₩ gr 63¢.....40@40&10%
Awls, Shouldered Brad..2.70 ₩ gr.....35%
Awls, Handled Brad..$7.50 ₩ gr.....45%
Awls, Handled Scratch ₩ gr, $7.50.35&10%
Awls, Socket Scratch, ₩ doz, $1.50.25@30%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality.....	$8.00	$8.50
Others.....	7.50	8.00

Axle Grease—See Grease, Axle.

Axles—

No. 1,4¼@5¢, No. 2 5½¢@6¼¢
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
} 3% cash

Concord Axles, loose collar.....5¢@6¢
Concord Axles, solid collar.....6¢@7¢
National Tubular Self-Oiling..... 33⅓&@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances.....40%

No.	2000	20	30
Chatillon, ₩ doz....	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Bars.

Crow—
Cast Steel.....₩ ₺ 4¼¢
Iron, Steel Points.....₩ ₺ 3½¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '82...50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—
Dover.....₩ doz $1.50
Duplex (Standard Co.).....₩ doz $1.25
Rival (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)..... ₩ doz $3.50
Bryant's.....₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral (H. & R. Mfg. Co.).....₩ gro $4.50
Improved Acme (H. & R. Mfg. Co.)..... ₩ gro $9.00
Paine, Diehl & Co.'s.....₩ gro $24.00
Silver & Co.....₩ doz $5.50

Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....50%

Bells—

Cow—
Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....₩ ₺ 8¢@3½¢
Steel Alloy Church and School Bells..40%

Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Electric,
Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's.....20%

Hand—
Light Brass.....75&10%
Extra Heavy.....65&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe(Cone's Patent).....25&10@35%

Bellows—

Blacksmiths'.....60&5@65%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70@70&5%
Standard.....60&10&10@70%
Extra.....50&10@60%
N.Y.B.&P.Co., Carbon...50&5@50&10&5%
N.Y.B.&P.Co., Diamond....40&5@40&10%

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 20, 1889... See Trade Report.
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Boards, Stove.

Wood Lined "Crystal".....50%
"Embossed".....50%
"Oxidized".....45%
Paper Lined Zinc.....55%
"Crystal".....55%
"Embossed".....55%
"Oxidized".....45%

Bolts—

Carriage, Machine, &c.—
Com. list June 10, '84.....70&10&5&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890..... 75&10@75&10&5%
Bolt Ends, list Jan. 1, 1890..... 75&10@75&10&5%

Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list...55&10%
Wr't Sunk Flush, Stanley's list...50&10%
Wr't B.K.Flush. Com'n " ...55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
R. B. & W., Plow.....55%

Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company: Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company: Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.

Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....50&10&10%
Clark's.....33⅓@35%

Borax.....₩ ₺ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.

Per ₺.....2¾¢

Braces.—

American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5%
Ball Braces, net.....$1.12 to $1.25¢
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 38.....60%
Nos. 40 to 63.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5&50&10%
Fray's No. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent s list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods—See Wire.

Broilers—

Heuis' Self-	Inch.....	9	10	9x11
Basting.	Per doz...	$4.50	5.50	6.50

New Haven.....50%

Buckets, Well.

Galvanized—
Hill's.....₩ doz. 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₩ doz. 14 qt, $4.25@$4.50
Helwig's Flat Iron Band.....$4.25@4.50
Helwig's Wired Top....₩ doz $4.00@4.25

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers Butchers'.

Butts—

Brass—
Wrought Brass.....75&10@80%
Cast Brass, Tiebout's.....50%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} 70&5@ 70&10%

Wrought Steel—
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
} 70&10%

Bronsed Wrought Butts.....50

Calipers—See Compasses.

Calks, Toe—

Gautier.....₩ ₺ 5½@6¢
Dewicks (Burke).....₩ ₺ 5½@6¢

Can Openers—See Openers, Can.

Cards—

Horse & Curry.....10&10&10&10%
Cotton.....10&10&10%
Wool.....10&10&10%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sw Carpet.

Cartridges—See Ammunition.

Casters—

Bed.....
Plate.....
Shallow Socket.....
} Brass....55@55&10%
} Others...60@60&10%

Deep Socket.....40&10%
Yale Casters, list May, 1884....30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phoenix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Chain—

Trace, Wagon and Fancy Chains, List revised April 21, 1890.....50&10@60%

American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.75	5.45	4.55	4.00	3.65	3.50	3.40	3.30

Less than cask lots, add ½¢@1½¢ ₩ ₺.
German Coil, list Oct. 6, 1890 50&10&5&60%
German Halter Chain, list Oct. 6, 1890 50&10&5&60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Covert Heel Chain.....50&2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₩ ₺ 5½@6¢
Jack Chain, Iron.....75&10@80%
Jack Chain, Brass.....75@75&10%

Chalk—

White.....₩ gr 50¢
Red.....₩ gr 70¢
Blue.....₩ gr 85¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W.....
New Haven.....
Witherby.....
Mix.....
Ohio Tool Co.....
} ..75 @ 75&10

Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%

Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to $
Buck Bros.....30%
Cold Chisels. ₩ ₺.....15@16%

Chucks—

Beach Pat.....each, $8.00.....20%
Morse's Adjustable,each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.

Tiffin Union No. 1, 5 gallon...$3.25 each
Tiffin Union No. 2, 7 gallon...$3.75 each
Tiffin Union No. 3, 10 gallon...$4.25 each

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....60&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.

Butchers'.

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips—

Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16. 65&5%
Superior Axle Clips.....66⅔&5&70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₩ ℔, 5½¢
Steel Felloe Clips.....₩ ℔, 6¢
Baker Axle Clips.....55%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2%

Coffee Mills—See Mills, Coffee.

Collars, Dog, &c.

Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@60%

Combs, Curry.

Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....20%
Perfect.....50%

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord, Sash—

Common.....₩ ℔ 10@11¢
Patent, good quality.....₩ ℔ 13@13½¢
White Cotton Braided, fair...₩ ℔ 28@29¢
Common Russia Sash.....₩ ℔ 13½¢
Patent " " .....₩ ℔ 15¢
Cable Laid Italian Sash.....₩ ℔ 22@23¢
Indian Cable Laid " .....₩ ℔ 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....28@30%
B Quality, Drab, 55¢.....31@33%
C Quality, White (only).....26@27¢
Sylvan Spring, Extra Braided,White, 34¢
Sylvan Spring, Extra Braided, Drab..30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢...30@30&5%
Braided, Drab Cotton, 55¢....30@30&5%
Braided, Italian Hemp, 55¢...30@30&5%
Braided, Linen, 80¢.....30@30&5%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50&5&2@50&10&2%

Crayons.

White Crayons, ₩ gr, 12¢@12½¢.....10%
D. M. Steward Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
M. Steward Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain.

Cutters—

Meat.

Dixon's ₩ doz.....40&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's ₩ doz.....40&5%

Nos.	100	150
	$15.00	$18.00

Hales Pattern ₩ doz.....70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American.....50%

Nos.	1	2	3	4	5
Each	$5	$7	$10	$25	$50	$60

Enterprise.....30%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Great American Meat Cutter.....30%

Nos.	112	116	118	120	122
Each	$2.00	$2.75	$3.00	$2.50	$4.00

Miles' Challenge ₩ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1.....₩ doz, $26.00, 55&10%
Draw Cut, each:

Nos.	5	6	8
	$50	$75	$80	$225

.....20@25%
Great American.....30%
Beef Shavers (Enterprise).....20&10@30%
Little Giant.....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00

Tobacco.

Champion.....20&10@30%
Wood Bottom.....₩ doz $5.00@$5.25
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%

Washer.

Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's.₩ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Cutlery—

Beaver Falls & Booth's.....33⅓
Wostenholm,...New list in preparation

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—

Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz. 15.00
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers...₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5&50&10%
Gibbs Post Hole Digger, ₩ doz $30.00, 50¢
Imperial, ₩ doz $15.....45%

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, ₩ doz.....$18@$20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's....each $2.50, 25&10&40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....30@20&5
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85

Twist Drills—

Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans-See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....20@20&10%
Disston's.....50%
Buck Bros.....30%
Stanley R. & L. Co.'s
Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....60%&10&10%
P. S. & W.....70%
Knapp & Cowles No.1.....60&20&70%
No. 1 Extra.....60@60&10
Nos. 00 & 4.....50&5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00,25&10%
Syracuse Screw-Driver Bits....30&30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 3, $12.00, 25@35&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits....%

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—No. 4 to No. 54 to Flour,CF

	46 gr.	150 gr.	F. FF.
Kegs, ₩ ℔	4½¢	5 ¢	2½¢
½ kegs, ₩ ℔	4¾¢	5¼¢	2¾¢
¼ kegs, ₩ ℔	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6¼¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7¼¢

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.

List No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Fasteners, Blind—

Mackrell's, ₩ doz. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Washburn's Old Pattern, ₩ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008 ₩ gr.....$9.00
Security Gravity, ₩ gr.....$9.00

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list. 60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $50.00.....20&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—

Derby and Cincinnati.....45&5%
Brewster.....50&5%

Files—

Domestic—

Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60&10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%

Imported—

Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fixtures.

Grindstone—

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—

Hay, Manure, &c., Asso List....66⅔@70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Frames—

Saw—

White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%

Screen, Window and Door—

Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons..33⅓@33⅓&10%
Stearns' Frames and Corners..25@25&10%

Freezers, Ice Cream—

White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Shepard's Lightning.....65@65&5%
Gem.....55%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....50%
Peerless and Giant.....60&10%
Zero and Pet.....65&10%
Boss.....65&10&10%
Keystone, P. D. & Co., each, $1.50.....30%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.

Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10 ¢; 2 to 5 gro., 20 ¢; 5 to 10 gro.....30 ¢
Copper, 1 to 6 doz., 15 ¢; 6 to 12 doz., 20 ¢; over 12 doz.....25 ¢

Fuse— ₩ 1000 ft

Common Hemp Fuse,for dry ground.$2.70
Common Cotton Fuse,for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr. 4.85
Triple Taped Fuse, for very wet gr.. 5.00
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—

Stebbin's Pattern.....75&10@80%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10%
Weed's.....20&10%
Boss, ₩ doz:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....10&10%

Gimlets—

Nail and Spike.....50&10&5%
" Eureka " Gimlets.....40&10%
" Diamond " Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
" Bee," ₩ gr $12.....25@25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.

Fraser's.....Keg ₩ ℔ 4¢, Pail ₩ ℔ 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs...₩ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 35¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones—

Small, at factory.....₩ ton $7.50@9.00

Grindstone Fixtures—See Fixtures, Grindstone.

Hack Saws—See Saws.

Hafts. Awl.

Sewing, Brass Fer.₩ gr, $3.50.....45&10%
Pat. Sewing, Short.$1.00 ₩ doz.....40&10%
Pat. Sewing, Long.....₩ doz $1.20
Pat. Peg, Plain Top.₩ gr $10.00....45&10%
Pat. Peg, Leather Top.₩ gr $12.00.45&10%

Halters.

Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%
Covert's Adj. Web Halters.....35&2 %

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co. } 50@50&10%
Fayette R. Plumb
C. Hammond & Son
Verree
Hartford, Nail Hammers...35&10@40&5%
Hartford, Machinists, &c.....50@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%

Heavy Hammers and Sledges—

3 ℔ and under.....₩ ℔ 40¢ } 70@70&10%
3 to 5 ℔.....₩ ℔ 36¢ }
Over 5 ℔.....₩ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢₩ ℔

Handcuffs and Leg Irons—See Police Goods,

Handles—

Atkins' No. 1 Loop, ₩ pair, 28¢; No. 13¢; No. 6, 16¢; No. 2 and No. Reversible, 18¢.

Cross-Cut Saw Handles—

Boynton's Loop Saw Handles, 50¢....60%
Champion.....15%

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3
Per doz.	$0.90	1.00	1.18	1.35	1.50

60&10&10%

Roggin's Latches.....₱ doz 30¢@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88 ..... net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50
Hickory Firmer Chisel, large. ₱ gr 5.00
Apple Firmer Chisel, ass'd...₱ gr 5.00
Apple Firmer Chisel, large...₱ gr 6.00
Socket Firmer Chisel, ass'd...₱ gr 3.00
Socket Framing Chisel, ass'd.₱ gr 5.00
J. S. Smith & Co.'s Pat File.....50%
File, assorted..... ₱ gr 9 75 } 40@
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass..... ₱ set $1.25
Pat. Auger, Swan's..... ₱ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track 65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
Climax Anti-Friction for Wood Track55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cheritree.....50&10%
Kidder's.....50&10@60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50@5%
Wood Track Iron Clad, ₱ ft. 10¢.....50 &15@60%
Carrier Steel Anti-Friction.....60&10%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@50&5%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel 40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
Blood's
Hunt's
Hurd's
Mann's
Peck's
Underhill's } 40 & 10 @ 50&5 %
Buffalo Hammer Co.
Fayette R. Plumb.
C. Hammond & Son.
Kelly's
Sargent & Co.
P., S. & W. Co.
Ten Eyck Edge Tool Co.
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Palmer.....50&5&10%
Seymour .....70&2%
Huffer 50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10&55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $0.00; No. 3, for Brick, $11.50. .....10%

Gate Hinges—

Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic .....₱ doz $12.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's..... 45&10%
Shepard's .....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%

Spring Hinges—

Union Spring and Blank Butts.....40%
Gear's Spring Hinge Co.'s list, March, 1886 .....20%
Acme.....30%
J. S.....25&10%
Empire and Crown.....20%
Hero and Monarch 55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting..... 25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Bardsley's Patent.....40%
Stearn's.....50&10%

Wrought Iron Hinges

Strap and T.....75&10%
Screw Hook and Strap..... { 6 to 12 in., ₱ ℔ .4 2-10 / 14 to 20 in., ₱ ℔ .3 7-10 / 22 to 36 in., ₱ ℔ .3 2-10
Heavy Welded Hook..... { 6 to 12 in., ₱ ℔ .4 2-10 / 14 to 20 in., ₱ ℔ .3 7-10 / 22 to 36 in., ₱ ℔ .3 2-10
Screw Hook and Eye { ⅜ in., ₱ doz $1.50 / ½ in., ₱ doz $2.45 / ⅝ in., ₱ doz $3.80 } 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges "Providence" { 8, 10 & 12 in., ₱ ℔ .....5¢ / over 12 in., ₱ ℔ .....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co.,S.& O. Pat. } 50&10&5 @60%
Am. Axe and Tool Co., S. & O. Pat. }
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....66⅔&70%
Planter's, Cotton, &c.....66⅔&70%
Warren Hoe.....60%
Magic..... ₱ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₱ doz $18.....60%

Bit.

Extension,
Barber's, ₱ doz $15.00.....40@40&10%
Ives, ₱ doz $20.00.....60&5@60&10%
Diagonal..... ₱ doz $24.00, 40%
Angular..... ₱ doz $24.00, 40&5%

File and Tool—

Bals Pat.....₱ doz $4.00; 25%
Nicholson File Holders..... 20%
Dick's Tool Holder.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list..... } 60&10&10%
Bird Cage, Reading.....
Clothes Line, Sargent's list..
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%

Wrought Iron—

Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....60%
Handy Hat and Coat.....50&10%
Steady Ceiling Hooks.....50&10%
Belt.....80@80&10%
Atlas, Coat and Hat.....60%

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....65@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks .....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra..... 50&10@60%
N. Y. B. & P. Co., Para..... .....25&5%
N. Y. B. & P. Co., Extra..... 40@40&5%
N. Y. B. & P. Co., Dundee... 50&10 @ 60%

Huskers—

Blair's Adjustable..... ...₱ gr $8.00
Blair's Adjustable Clipper. ...₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₱ 100 ℔, $2.30@$2.40
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'....₱ doz $18.00 net
Mrs. Pott's Irons..... .....50&5%
Enterprise Star Irons..... .....50&5%
Cold Handle Sad Irons..... .....50&5%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons..... .....25%
B. B. Sad Irons, ₱ ℔.....3 @3½¢
Combined Fluter and Sad Iron, ₱ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England..... .....5¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible..... .....20@20&5%
National Self-Heating.....30%

Soldering—

Soldering Coppers..... ₱ ℔ 22 @ 23¢
Covert's Adjustable, list Jan. 1, 1886. .....35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy..... .....33⅓%
Victor..... .....33⅓%

Kettles—

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ ℔....	24¢	23 ¢
Brass larger than 17 in., ₱ ℔.....	26¢	24½¢

Enameled and Tea—See Hollow-Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, list Oct. 1, 1890 .....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c..... ...40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....30%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Corn—

Bradley's..... .....10%
Wadsworth's..... .....25%

Drawing—

Witherby, P. S. & W., Mix, New Haven, Merrill ..... .75@ 75&10 %
Douglas.....60&10@60&10&5%
Watrous.....75@75&5%
L. & I. J. White.....15&10@25%
Bradley's.....20&25%
Adjustable Handle.....35%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning. Mfrs'. price ₱ doz $18.00, 25% But jobbers cut this price freely, often selling at $8 @ $8.50.
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₱ doz $11.00@$11.50
Heath's.....₱ doz $13.00@13.50
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz.$7.00 @ $8.00

Mincing.

Am. (2d quality), ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....30&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 .....40@45%
Knapp & Cowles.....50&10&60%
Buffalo Adjustable.....₱ doz $3.00 ,25%
Buffalo Double Adj'table. ₱ doz $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70@75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladles.—

Melting, Sargent's.....	55&10%
Melting, Reading.....	35&10%
Melting, Monroe's Pat...₱ doz $4.00,	40%
Melting, P. S. & W.....	35&10@40%
Melting, Warner's.....	30%

Lanterns—

Tubular—

Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards.....$4.00@4.25
Sq. Lift Wire, with Guards....$4.25@4.50
Without Guards, 25¢ ₱ doz less.

Miscellaneous.

Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason. Beckley & Co.'s.....70%
Sargent's.....66⅔&10%
Hotchkiss..... .....30%
Peck, Stow & W. Co..... ...60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield..... .....50%
Reiher's, list Sept. 1, 1890.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2½
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.....30%
Mason's Colored Cotton..... .....45%
Wire Clothes.. Nos. 12 16 20
100 ft. $4 00 $3 50 $3.00
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan. 1, '85..33⅓&2%
Deltz, Nos. 36 to 39.....40%
Deltz, Nos. 51 to 63.....40&10%
Deltz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net prices
Romer's.....25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889..... } 65&10@70 Much lower net prices often made.
Mallory, Wheeler & Co., list July, '88..... }
Sargent & Co., list Aug. 1, '88 }
Reading Hardware Co., list Feb. 2, '88..... }
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deltz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock..... .....25%

Padlocks—

List Dec. 23, '84.....75@75&10%
Brittan, Graham & Mathes.....75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deltz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9. 40@40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian:
Nos. 119, 120, 130 and 140..... .90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker Barry & Co.
No. 41 line.....45&5%
No. 31 line.....60&5%
No. 21 line.....75&5%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₱ gr.. .33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886. 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....65%&10@65%&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model .....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Lieseche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00..... .....20@20&10%
Davis, Bronze, Barnes Mfg. Co.... 50%
Champion Safety, list March 1, 1888 .....55@55&5%
Security.....70%
Buckeye.....₱ gro $4.80

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₱ doz, $1.75; ₱ gross..... .....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas.....	$5.50	$6.75	.....50%
Snell's, Rice's Pat.	5.50	6.75	.40&10&10%
Jennings	5.50	6.75	.45@45&10%
Other Machines...	2.25	2.75	.....
Phillips' Patent with Augers ...	7.00	7.50	.....

Fluting.

Knox, 4½-inch Rolls .....$3.25 each } 35%
Knox, 6-inch Rolls..... .....$3.60 each }
Eagle, 3¼-inch Roll, $2.15..... .....35%
Eagle, 5½-inch Roll, $2.85..... .....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each 35%
Crown Jewel, 6 in .....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each..... .....35%
Domestic Fluter ..... each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00..... .....30%
Shepard Hand Fluter, No. 85 ₱ doz 15 30 .... 40%

Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter. ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30% ₱ doz $10.00.....10%
Buffalo .....

Hoisting—
Moore's Hand Hoist, with Lock Brake.....30%
Moore's Differential Pulley Block...40%
Energy Mfg. Co's.....25%

Mallets.

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. .....30@30&10%

Mattocks. Regular list..... .....60&10%

Measures—
Standard Fiberware, No. 1, peck, ₱ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Mills.

Coffee—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20&10%

Mincing Knives — See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers — See Drawers, Money.

Mowers, Lawn.

Leading makers.....60@60&10&5%
Other makers.....60&10&5@60&10&10%
Pennsylvania.....60%
Continental.....60%
New Model.....60&10&5%
New Quaker City.....60&10&5%
Great American.....60&10&5%

Muzzles—
Safety.....₱ doz, $3.00, 25%

Nails.

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15,'89..75@75&5%
Tack Mfrs.' list.....60&10&10%
Wire Nails, Standard Penny.
Card June 1, '89, base $2.70 @ $2.75

Horse—See Trade Report.

Nos.	6	7	8	9	10
Ausable	.28¢	26¢	25¢	24¢	23¢.

40&5&2%

Clinton, Fin..19¢ 17¢ 16¢ 15¢ 14¢..... 30%
Essex ....28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Lyra .....19¢ 17¢ 16¢ 15¢ 14¢.....30%
Snowden 19¢ 17¢ 16¢ 15¢ 14¢.....30%
Putnam.....23¢21¢ 20¢ 19¢ 18¢. 1000 ℔ in year 15%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢. 25@25&5%
Globe .....23¢ 21¢ 20¢ 19¢ 18¢...25&10%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢. 20&5&5&2½%
A. C.....25¢ 23¢ 22¢ 21¢ 21¢. 25&10@33⅓&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
Maud S.....25¢ 23¢ 22¢ 21¢ 21¢. 40&10&5&2 %
Champlain .23¢ 6¢ 25¢ 24¢ 23¢. 25&10@25&10%
New Haven..23 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion ...25¢ 23¢ 22¢ 21¢ 20¢. 10&10&10%
Capewell.....28¢ 26¢ 5¢ 24¢ 23¢. 35&5@35&10%
Star.....23¢ 21¢ ve 19¢ 18¢. 10&10@10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronsed.....14 ₱ D.

Picture—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Nail Pullers.—See Pullers, Nail.

Nail Sets.—See Sets, Nail.

Nut Crackers.—See Crackers, Nut.

Nuts—
Nuts, off list Dec. 18,1889: Square. Hex.
Hot Pressed..... 5.45¢ 6.00¢
Cold Punched..... 5.00¢ 4.90¢
In lots less than 100 ℔, ₱ ℔, add ⅛¢; 1-lb boxes, add 1¢ to list.

Oakum—

Government.....₱ ℔ 7@7½¢
U. S. Navy.....₱ ℔ @6½¢
Navy.....₱ ℔ 5½@5½¢

Oilers—
Zinc and Tin.....65&10&70%
Brass and Copper .....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper 50%
Broughton's Zinc.....60%
Broughton's Brass 50%
Gem P. D. & Co. .....₱ gro. $2
Steel, Draper and Williams.....50%

Openers, Can.

Messenger's Comet.....₱ doz $3.00, 25%
American.....₱ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....₱ doz $3.75, 20%
No. 4 French.....₱ doz $2.25, 55&60%
No. 5, Iron Handle.....₱ gr $6.00, 45&50%
Eureka.....₱ doz $2.50, 10%
Sardine Scissors.....₱ doz $2 75@3.0.
Star.....₱ doz $2.75
Sprague, No 1, $2.00 2, $2.25; 3, $2.50- 50&10&10%
Excelsior, No 1, $2.50; No. 2, $1.55...40%
World's Best, ₱ gross, No. 1, $12.00- No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₱ doz $3.00..... ...45&5%
Domestic, ₱ doz $2.50..... ..65%
Champion ₱ doz $2.00..... ..5[illegible]

Packing, Steam—

Rubber—
Standard.....60&5@65%
Extra.....50@50&5%
N. Y. B. & P. Co., Standard..40&10@50%
N. Y. B. & P. Co., Empire....60&5@65%
N. Y. B. & P. Co., Salamander. ₱ ℔ 65¢, 10@15%
Jenkins' Standard. ₱ ℔ 80¢....25@25&5%

Miscellaneous—
American Packing.....10@11¢ ₱ ℔
Russia Packing .....14¢ ₱ ℔
Italian Packing .....15¢@14¢ ₱ ℔
Cotton Packing .....15¢@17¢ ₱ ℔
Jute.....7¢@8¢ ₱ ℔

Padlocks—See Locks.

Pails.

Galvanized Iron—

	Quarts	10	12	14
Hill's Light Weight, ₱ doz.		$2.75	3.00	3.25
Hill's Heavy Weight, ₱ ds.		3.00	3.25	3.75
Helwig's		2.75	3.00	3.25
Sidney Shepard & Co.....		2.35	2.85	3.05
Iron Clad		2.50	2.75	3.00
Fire Buckets		2.75	3.25	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt .....₱ doz $6.00
Fire, Stable and Milk, 14 qt ..₱ doz $7.80

Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No.1, 12 qt. per doz	4.50	
Fire Pails, No.2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pans.

Dripping.
Small sizes.....₱ ℔ 6½¢
Large sizes.....₱ ℔ 5½¢
Silver & Co. (Covered).....40%

Fry—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....70&10%
Acme Fry Pans .....60&10%

Paper and Cloth—

Sand and Emery—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Parers.

Apple.
Advance.....₱ doz $4.75
Baldwin.....₱ doz 5.25
Bonanza.....each 5.00
Champion.....₱ doz 7.25
Daisy.....₱ doz 4.00
Dandy.....each 7.50
Eureka, 1888.....each 16.00
Family Bay State.....₱ doz 12.00
Favorite.....₱ doz 5.00
Gem.....₱ doz 5.25
Gold Medal.....₱ doz 4.00
Ideal.....₱ doz 4.00
Improved Bay State..₱ doz 27.00 @ 30.00
Little Star.....₱ doz 4.50
Monarch.....₱ doz 13.50
New Lightning.....₱ doz 5.50
Oriole.....₱ doz 4.00
Penn.....₱ doz 4.00
Perfection.....₱ doz 4.00
Pomona.....₱ doz 4.00
Rocking Table.....₱ doz 6.00
Turntable.....₱ doz 4.50
Victor.....₱doz 13.50
Waverly.....₱ doz 4.00
White Mountain.....₱ doz 4.00
72.....₱ doz 4.25
76.....₱ doz 5.75
78.....₱ doz. 6.50

Potato—
White Mountain .....₱ doz $4.50
Antrim Combination.....₱ doz $5.50
Hoosier.....₱ doz $18.50
Saratoga.....₱ doz $5.50

Pencils—
Faber's Carpenters'..... ..high list 50%
Faber's Round Gilt.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters' ....40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.

Box—
Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W. Co... 50&10@50&10&5%

Curtain—
Silvered Glass.....net
White Enamel.....net

Escutcheon,
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain 47½%
1¼ and under, Galvanized 40%
1½ and over, Plain.....60%
1½ and over, Galvanized 47½%
Boiler Tubes, Iron.
1¾ and under.....45%
2 to 4 inch.....50%
4-inch and larger.....52½%

Planes and Plane Irons—

Wood Planes—
Molding.....35&2%
Bench, First Quality.....50&2%
Bench, Second Quality.....55&2%
Bailey's (Stanley R. & L. Co.). ...40&10%

Iron Planes—
Bailey's (Stanley R. & L. Co.)..... 40&10@40&10&10%
Miscellaneous Planes (Stanley R. & L. Co.) .....20&10@20&10&10%
Victor Planes (Stanley R. & L. Co.). ..... 20&10@20&10&10%
Steer's Iron Planes.....35@35&10%
Merrien Mal. Iron Co.'s.....40@40&10%
Davis's Iron Planes .....40@40&10%
Birmingham Plane Co.....50@50&10%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes .....40@40&10%
Sargent's ..... 30&10@30&10&10%
Standard Tool Co.....50@50&5%

Plane Irons—
Butcher's.....$5.00@$5.25 to £
Buck Bros 30%
Auburn "Thistle..... ..... } 35&2%
Ohio..... }
Sandusky..... }
S. & I. J. White.....25%

Plates.

Felloe .....₱ ℔ 6¢@6½¢

Pliers and Nippers—
Button's Patent.....50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz .....20&10@33⅓%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel.....25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List .....70&10@70&10&10%
Disston's.....50%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers .....10&10%

Poachers.

Egg.
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00: No. 2, $9.00..... 25%
Silver & Co., 6-Ring..₱ doz $4; 3-Ring $2

Pokes, Animal—
Bishop's I. X. L.....₱ doz $6.00
Bishop's O. K..... .....₱ doz $5.25
Bishop's Pioneer.....₱ doz $3.75
Bishop's American..... .....₱ doz $2.75
Eagle, Double Stale..... .....₱ doz $5.75
Eagle, Single Stale.....₱ doz $3.75
Buckeye, Single Stale.....₱ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....35%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish, Metal.
Prestoline.....30%
Prestoline Paste..... .....33⅓%
Gaston's Silver Compound.....33⅓%

Polish, Stove.
Joseph Dixon's.....₱ gro $6.00, 10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror .....₱ pro $6.00, —%
Lustro .....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots .....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ 8¢
Boynton's Noon Day, ₱ gro 13.00
Parlor Pride Stove Enamel..₱ gro
Yates' Liquid, 2 3 5 10 gal.... ₱ gal ...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 12½¢
Jet Black ....₱ gro $3.50
Japanese. .....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Bensine Paste, 5 and 10 ℔ cans .....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans .....12½¢
Nickel Plate Paste .....₱ gro $6.00

Poppers, Corn—
Round or Square, 1 qt..₱ gr $10.00@10.50
Round or Square, 1½ qt ..₱ gr $15@15.50
Round or Square, 2 qt..₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.

Glue—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Presses.

Fruit and Jelly—
Enterprise Mfg. Co.....20&10@30%
Henis .....₱ doz $3.50
Shepard's Queen City 40%
Silver & Co.....₱ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.

Nail.
Curtiss Hammer.....₱ doz $9.00
Giant, No. 1.....₱ doz. $13.00, 10%
Giant, No. 2.....₱ doz, $15.00, 10%
Pelican.....₱ doz, $9.00, 25%

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw..... .....60&10%
Brass Screw.....60&10%
Japanned Side.....60&&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55@60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 .....50%
Hay Fork, "F" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating ...60%
Shade Rack 45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00... .....40%

Pumps—
Cistern, Best Makers .....60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper Goods.70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality....₱ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check ..40%
Solid Tinners', P.S.&W.Co., ₱ doz $1.44. 55%
Tin'rs' Hollow Punches P.S.&W.Co.20&2%
Rice Hand Punches 15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wr't Brass, ₱ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door Light. In. ½ ⅝ ¾
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet.	$2.15	2.70	3.25..net

Terry's Steel Rail, ₱ foot.....4½¢
Victor Track Rail, 7¢ ₱ foot.....50&2%
Carrier Steel Rail, ₱ foot.....4½¢
Moore's Wrought Iron.....25%

Rakes—
Cast Steel, Association goods...66⅔@70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable.....70@70&5%
Gibbs Lawn Rake.....$12.00, 50&15
Canton Lawn Rake..... .$9.00, 50&10
Ft. Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00..... .....25%

Razors—
J. R. Torrey Razor Co 30%
Wostenholme and Butcher, $10.00 to £. 10%
Jordan's AAA1, list Nov. 1, 1889.....50%
Jordan's Old Faithful, list Nov. 1,'89.50%
Electric.....List net

Razor Strops—See Strops, Razor.

Rings and Ringers.

Bull Rings—
Union Nut Co.....55%
Sargent's.....66⅔&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co's..50&10&50&10&10%
Ellrich Hdw. Co., White Metal, low list, 50@50&10%

Hog—
Top of the Hill Ringers. .....₱ doz $2.00
Top of the Hill Rings. .....₱ doz $1.25
Hill's Improved Ringers . ..₱ doz $1.25
Hill's Old Style Ringers.....₱ doz $1.12½
Hill's Tongs. .....₱ doz $3.00
Hill's Rings.....₱ doz bxs $1.00
Perfect Rings.....₱ doz bxs $1.50
Perfect Ringers.....₱ doz $2.15@$2.25
Blair's Hog Ringers.....₱ doz $2.00
Blair's Hog Rings.....₱ doz 90¢@$1.00
Champion Ringers.....₱ doz $2.00
Champion Rings, Double.....₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.15@1.25

Rivets and Burrs—
Iron, list Nov. 17, '87.....40%
Copper.....50&10%
Coppered Iron, Bettina Brand.....40%

Rivet Sets—See Sets.

Rods—
Stair, Brass .....25&2%
Stair, Black Walnut .. ..₱ doz 40¢

Rollers—
Barn Door, Sargent's list .....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller 70%

Rope—
Manila...½ in. and larger .....₱ ℔ 14½¢
Manila.....⅜ in. ₱ ℔ 15 ¢
Manila.....¼ and 5-16 in. ₱ ℔ 16½¢
Manila Tarred Rope.....₱ ℔ 14 ¢
Manila, Hay Rope.....℔ 14½¢
Sisal.....½ inch and larger ₱ ℔ 9½¢
Sisal .....⅜ in. ₱ ℔ 10½¢
Sisal.....¼ and 5-16 in. ₱ ℔ 10½¢
Sisal, Hay Rope. .....₱ ℔ 9½¢
Sisal, Tarred Rope.....₱ ℔ 9½¢
Sisal, Medium Lathe Yarn.....₱ ℔ 8½¢
New Zealand..½ in. and larger ₱ ℔ 8½¢
New Zealand..... ⅜ inch, ₱ ℔ 10½¢
New Zealand, ¼ and 5-16 inch, ₱ ℔ 9½¢
New Zealand, Hay Rope.....₱ ℔ 8½¢
New Zealand, Tarred Rope.....₱ ℔ 8½¢
Note.—Manufacturers' prices on above ⅛¢ ₱ ℔ less.
Cotton Rope..... ₱ ℔ 15@18¢ net
Jute Rope..... .....₱ ℔ 7½¢

Wire—
List May 1, 1886.
Iron.....32½&2½%
Iron, Galvanized.....40&2½%
Cast Steel.....40&2½%

Rules—
Boxwood.....80&10&10@80&10&10&10%
Ivory..... .....50@50&10%
Starrett's Rules and Straight Edges, Steel..... .....25&10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
Disston's Circular 45%
Disston's Cross Cuts.....45%
Disston's Hand.....20%
Woodrough & McParlin.
Hand, Panel and Rip 25%
Narrow Champion Cross Cuts with Handles, ₱ foot.....20¢
Champion Thin Back Cross Cuts, ₱ foot.....28¢
Champion Extra Thin Back Cross Cuts, ₱ foot.....31¢
One Man Champion Cross Cuts, ₱ foot.....40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....30%
Narrow Champion Cross Cuts with Handles, ₱ foot.....20¢
Champion Thin Back Cross Cuts, ₱ foot. .....28¢
Champion Extra Thin Back Cross Cuts, ₱ foot.....31¢
One Man Champion Cross Cuts, ₱ ft.40¢

Atkins' Circular Shingle and Heading ..... dis 50%
Atkins' Silver Steel Diamond X Cuts ..... ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ..... ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ..... ₱ foot 32¢
Atkins' Champion and Electric Tooth X Cuts ..... ₱ foot 30¢
Atkins' Hollow Back X Cuts. .₱ foot 20¢
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw, with handles, ₱ foot 40¢
Peace Circular and Mill 45%
Peace Hand Panel and Rip 25%
Peace Cross Cuts 45%
Richardson's Circular and Mill 45%
Richardson's X Cuts 45%
Richardson's Hand, &c 25%

Hack Saws—

Griffin's, complete ..... 40&10@50%
Griffin's Hack Saw, Blades ..... 40&10@50%
Star Hack Saws and Blades 25%
Eureka and Crescent 35%

Scroll—

Lester, complete, $10.00 ..... 25%
Rogers, complete, $4.00 ..... 25%
Barnes' Builders' and Cabinet Makers', $15 ..... 25%
Barnes' Scroll Saw Blades 35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161 ..₱ doz $6.75@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.20@2.30
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10%
Richie Bros.' Platform 40%

Scale Beams—See Beams, Scale

Scissors, Fluting 45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.50 ..... 30&10%
Box, 1 Handle ..... ₱ doz $4.00. 10%
Box, 2 Handle ..... ₱ doz $6.00. 10%
Defiance Box and Ship ..... 20&10%
Foot ..... 50&10@60%
Ship, Common ..... ₱ doz $3.50 net
Ship, R. I. Tool Co 10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron ..... 55&10@55&10&10%
Bench, Wood, Beech ..... ₱ doz $2.25
Bench, Wood, Hickory ..... 20&10%
Hand, Wood ..... 25&10@25&10&5%
Lag, Blunt Point, list Jan. 1, 1890. 75&10%
Coach and Lag. Gimlet Point, list Jan. 1, 1890 ..... 75@75&10%
Bed ..... 25&5%
Hand Rail, Sargent's ..... 60%&10%
Hand Rail, H. & B. Mfg. Co ..... 70&10@75%
Hand Rail, Am. Screw Co 75%
Jack Screws, Millers Falls list. .50@50&5%
Jack Screws, P. S. & W 35%
Jack Screws, Sargent ..60&10@60&10&5%
Jack Screws Stearns' ..... 40@40&10%

Cork—

Humason & Beckley Mfg. Co. .40&10@50%
Williamson's ..... 33⅓@33⅓&5%
Howe Bros & Hulbert 35%

Machine—

Flat Head, Iron ..... .55%
Round Head, Iron 50%

Wood—

List March 1, 1889.
Flat Head Iron 50%
Round Head Iron 40%
Flat Head Brass 45%
Round Head Brass 35%
Flat Head Bronze .. .45%
Round Head Bronze .. 35%
} Extra 10 @ 10&5 % often given.
Rogers' Drive Screws 66⅔%

Scroll Saws—See Saws, Scroll.

Scythe Snaths—See Snaths, Scythe.

Sets.

Awl and Tool.

Aiken's Sets, Awls and Tools, No. 20, ₱ doz $10.00 ..... .55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9. ..... 25@25&10%
Miller's Falls Adj. Tool Hdls.. Nos. 1, $12, 2, $18 ..... 25%
Henry's Combination Haft ..₱ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50. .70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 ..... 30&10%

Nail—

Square ..... ₱ gr., $4.00@$4.25
Round ..... ₱ gr. $3.25
Buck Bros 27½%
Cannon's Diamond Point ..₱ gr., $12, 20%

Rivet.

Regular list ..... 50&10%

Saw—

Stillman's Genuine ..₱ doz $5.00@7.75, 40&5%
Stillman's Imita ..... ₱ doz $3.25@5.25, 40&5@40&10%
Common Lever ..... ₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00. 40&10@50%
Leach's ..No. 0, $8.00; No. 1, $15, 15@20%
Nash's ..... 20&10@20&10&10%
Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 13⅓%
Aiken's Genuine ..... $13.00, 50&10%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 20%
Disston's Star 25%
Leopold ..... 40&10@50%
Atkin's Lever ..₱ doz No. 1, $6.00
Atkin's Criterion ..₱ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Chieftain H. R. Co.'s Superior ..... ₱ doz $15, 50%

Sharpeners, Knife.

Parkin s.
Applewood Handles ..₱ doz $6.00, 40%
Rosewood or Cocobolo. ₱ doz $9.00, 40%

Shaves, Spoke.

Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) ..... 40&10%
Stearns' ..... 30&10%
Cincinnati ..... 25&10%

Shears—

American (Cast) Iron ..75&10@75&10&5%
Barnard's Lamp Trimmers ..₱ doz $3.75
Tinners' ..... 20&2%
Seymour's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881. 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears 33⅓%
First quality C. S. Trimmers. .80@80&10%
Second quality C. S. Trimmers. 80&10@80&10&10%
Acme Cast Shears ..... 10&10%
Diamond Cast Shears 10%
Clipper ..... 10&10%
Victor Cast Shears ..... 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Chicago Drop Forge & F. Co., Solid Steel Forged 60%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list. 60%
Electric ..... List net

Pruning Shears and Hooks.

Disston's Combined Pruning Hook and Saw ..... ₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools 40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@ 4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P., S. & W. Co 60%

Tinners', &c.—

Shears and Snips (P. S. & W.) ..... 20@25%
Snips, J. Mallinson & Co 33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888 ..50&10@60&5%
R. & E., list Dec. 18, 1885 ..... 55&20%
Corbin's list ..... 60&10&2%
Patent Roller ..... 60&10&2%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 ..... 60&2%
Moore's Anti-Friction 50%

Sliding Shutter—

R. & E. list Dec. 18, 1885 ..... 60&10&2%
Sargent's list ..... 60&10%
Reading list ..... 60&10&10%

Ship Tools—

L. & I. J. White ..... 20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix, at factory. $4.00

Mule—

Add $1 ₱ keg to above prices.

Ox, Wrought—

Ton lots ..... ₱ ℔ 9¢
1000 ℔ lots ..... ₱ ℔ 9½¢
500 ℔ lots ..... ₱ ℔ 10¢

Shot—

(Eastern prices 2¢ off, cash, 5 days.

Drop, ₱ bag, 25 ℔ $1.62
Drop, ₱ bag, 5 ℔ ..... .38
Buck and Chilled, ₱ 25-℔ bag 1.87
Buck and Chilled, ₱ 5-℔ bag ..... .43

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885 ..... 20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron ..... 50&10%
Griffith's C. S. ..... 60@60&10%
Griffith's Solid C. S. R. R. Goods 20%
Old Colony (Sanford Fork & Tool Co). 35%
St. Louis Shovel Co ..... 20@20&7½%
Hussey, Binns & Co ..... 15@25%
Hubbard & Co ..... 20@20&7½%
Lehigh Mfg. Co ..... 50&10%
Payne Pettebone & Son, list January, 1886 ..... 30%
Remington's (Lowman's Pat.) ..30&10@40%
Rowland's, Black Iron ..... 50&10%
Rowland's Steel ..... 60&5@60&10%

Shovels and Tongs—

Iron Head ..... 60&10@60&10&5%
Brass Head ..... 60&10&10%

Sieves—

Mann's Tin Rim ..... 50&25%
Buffalo Metallic, S. S. & Co ..... 50&25%
Shaker (Earler's Pat.) Flour Sifters. ₱ doz $2.00; ₱ gr $21.60
Electric ..... ₱ gr $21.00
A. & W. Sifters ..... ₱ doz $2.00
Hunter's ..... ₱ doz $2.00
Smith's Adjustable Sifters ..... ₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	80¢	$1.00
Mesh 20, Nested, ₱ doz..	95¢	1.10
Mesh 24, Nested, ₱ doz..	$1.15	1.25

Skeins, Thimble—

Western list ..... 75&5@75&10%
Columbus Wrt. Steel. Special net prices
Coldbrookdale Iron Co 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 35%

Slates—

School, by case ..... 50&10@50&10&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.) 65%
Fitch's (Bristol) ..... 50&10%
Hotchkiss 10%
Andrews 50%
Sargent's Patent Guarded ..... 70&10&10%
German, new list ..... 40&10%
Covert ..... 50&5%
Covert, New Patent ..... 50&5&2%
Covert, New R. E ..... 60&2%
Covered Spring ..... 60&10&10%

Snaths, Scythe.

List ..... 50&10@50&10&5%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₱ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list ....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list ..... 70&10%
Buffalo S. S. & Co ..... 33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).

Meriden Brit. Co., Rogers ..... 40&15%
C. Rogers & Bros ..... 40&15%
Rogers & Bro ..... 40&15%
Reed & Barton ..... 40@40&5%
Wm. Rogers Mfg. Co ..... 40, 15&5%
Simpson, Hall, Miller & Co ..... 40, 15&5%
Holmes & Edwards Silver Co ..40, 15&5%
L. Boardman & Son ..... 50&12½%

Miscellaneous.

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver ..... 50&10&5%
No. 30 Silver Metal ..... 50&10&5%
No. 24 German Silver ..... 50&10&5%
No. 50 Nickel Silver ..... 50&5%
No. 49 Nickel Silver ..... 50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal ..... 50, 10&5%
18% Rogers' German Silver ..... 60&5%
22% Rogers' Nickel Silver. .. ....50&5%
German Silver ..... 50@50&5
German Silver, Hall & Elton. .50&5% cash
Nickel Silver ..... 50&5@50&10&5% cash
Britannia 60%
Boardman's N'ck'l Silver. 40&7½&5% cash
Boardman's Britannia Spoons, case lots ..... 50&12½&5% cash

Springs, Door.

Torrey's Rod, regular size ..₱ doz $1.30
Gray's, ₱ gr., $20.00 ..... 20%
Bee Rod ₱ gr., $20.00 ..... 20%
Warner's No. 1, ₱ doz., $2.50; No. 2, $3.30 ..... 40&10@50%
Gem (Coil), list April 19, 1886 ..... 10%
Star (Coil), list April 19, 1886 ..... 30%
Victor (Coil) ..... 60@60&10%
Champion (Coil) ..... 60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's ..No. 1, ₱ doz, $18.00; No. 2, $15.00 ..... 50%
Rubber, complete, ₱ doz, $4.50 ...55&10%
Hercules 50%
Shaw Door Check and Spring. 25@30@35%
Elliptic, Concord, Platform and Half Scroll ..... 60@60&5%
Cliff's Bolster Springs 25%

Squares—

Steel and Iron } ..... 80 &10%
Nickel-Plated } ..... 80 &10%
Try Square and T Bevels ..60&10@60&10 &10%
Disston's Try Square and T Bevels. ...50%
Winterbottom's Try and Miter ....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares 40%
Avery's Bevel Protractor 50%

Squeezers.

Fodder.—

Blair's ..... ₱ doz $2.00
Blair's "Climax" ..... ₱ doz $1.25

Lemon—

Porcelain Lined, No. 1 ..₱ doz $6.00, 25&30%
Wood, No. 2 ..... ₱ doz $3.00, 35%
Wood, Common ..... ₱ doz $1.70@1.75
Dunlap's Improved ..₱ doz $3.75, 20%
Sammis ..No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz ..... 25&10%
Jennings' Star ..... ₱ doz $2.50
The Boss ..... ₱ doz $2.50
Dean's ..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant ..... 60@50&5%
King ..... 40&5%
Hotchkiss Straight Flash ..₱ doz $12.00
Silver & Co., Glass ..... ₱ gro. $9.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—

Barbed, ½ in. and larger ..... ₱ ℔ 7@7½¢
Barbed, ⅝ in ..... ₱ ℔ 8@8½¢
Fence staples, Galvanized. } Same price as B'rb Wire. See Trd. Rep.
Fence Staples, Plain ..... }

Steelyards ..... 40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods ..... 40@40&10%
Butterfield's Goods ..... 40@40&10%
Lightning Screw Plate ..... 25@30%
Reece's New Screw Plates ..... 33⅓&5@40%
Reversible Ratchet ..... 30 %
Gardner 25%

Stops, Bench.

Morrill's ..... ₱ doz $9, 50%
Hotchkiss's ..... ₱ doz $5. 10@10&10%
Weston's, No. 1, $10; No. 2, $9. 25&10@5%
McGill's ..... ₱ doz $3 ..... 10%
Cincinnati ..... 25&10%

Stone—

Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone ..... ₱ ℔ 2½¢
Washita Stone, Extra ..... ₱ ℔ 20@21¢
Washita Stone, No. 1 ..... ₱ ℔ 15@16¢
Washita Stone, No. 2 ..... ₱ ℔ 11@12¢
Washita Slips, No. 1, Extra. ..₱ ℔ 37@40¢
Washita Slips, No. 1 ..... ₱ ℔ 25@26¢
Arkansas Stone, No. 1, 4 to 6 in ₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in ₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in ..... ₱ ℔ 40¢
Turkey Slips ..... ₱ ℔ $1.00@1.50
Lake Superior, Chase ..... ₱ ℔ 16¢
Lake Superior Slips, Chase ..₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand ..₱ ℔ 18@20¢
Seneca Stone, High Rounds ..₱ ℔ 20@25¢
Seneca Stone, Small Whets ..₱ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.

Cast Steel, Polished ..... ₱ doz $2.25
Cast Iron, Steel Points ..... ₱ doz 80¢
Socket ..... ₱ doz $1.75
Bullard's ..... 25@25&10%

Strops, Razor—

Genuine Emerson ..... 60@60&5%
Imitation " ..... ₱ doz $2.00, 20&10&5%
Torrey's 20%
Badger's Belt and Com ..... ₱ doz $2.00
Lamont Combination ..... ₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89. 50%
Electric ..... List net

Stuffers or Fillers, Sausage—

Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry ..... ₱ doz, No. 1, $15.00; No. 0, $21.00 ..... 50&5@50&10%
Draw Cut No. 4, each $30.00 ..... 20%
Enterprise Mfg. Co ..... 20&10@30%
Silver's ..... 40&10%

Sweepers, Carpet.

Bissell No. 5 ..... ₱ doz $17.00
Bissell No. 7 New Drop Pan. ₱ doz $19.00
Bissell, Grand ..... ₱ doz $36.00
Grand Rapids ..... ₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic ..... ₱ doz $15.00
Jewel ..... ₱ doz $17.00
Improved Parlor Queen, Nickeled ..... ₱ doz $27.00
Japanned ..... ₱ doz $24.00
Excelsior ..... ₱ doz $22.00
Garland ..... ₱ doz $18.00
Parlor Queen ..... ₱ doz $24.00
Housewife's Delight ..... ₱ doz $15.00
Queen ..... ₱ doz $16.00
Queen, with band ..... ₱ doz $18.00
King ..... ₱ doz $30.00
Weed, Improved ..... ₱ doz $18.00
Hub ..... ₱ doz $16.00
Cog-Wheel ..... ₱ doz $16.00
Conqueror ..... ₱ doz $22.00
Easy ..... ₱ doz $22.00
Monarch ..... ₱ doz $22.00
Goshen ..... ₱ doz $21.00

Tacks, Brads, &c.—

List Oct. 19, 1889. Standard Weights.

Carpet Tacks—
American Iron, Blued 77½%
Am'ican Iron, Tin'd or Cop'd. 77½%
Steel, Plain or Bright 75%
Steel, Tinned or Coppered 75%
Swedes Iron, Blued 75%
Swedes Iron, Tinned or Cop'd ..75%
American Iron Cut Tacks 75%
Swedes Ir. Uphol'rs' Tacks, Blued. 75%
Swedes Iron Upholsterers' Tacks, Tinned 77½%
Gimp and Lace Tacks, Blued 75%
Gimp and Lace Tacks, Tinned ..77½%
Swedes Iron Basket or Trimmers' Tacks ..... 70&10%
Miners' Tacks 77½%
Bill-Posters' or Railroad Tacks ..75%
Bill-Posters' or Railroad Tacks, Tinned 77½%
Copper Tacks 40%
Copper Finish, & Trunk Nails 40%
Cigar Box Nails 50%
Zinc Glaziers' Points 50%
Picture-Frame Points 50%
Looking-Glass Tacks 50%
Brush Tacks 60%
Tin-Capped Trunk Nails 60%
Finishing Nails 70%
Trunk and Clout Nails, Black and Tinned 72½%
Common and Patent Brads 70%
Hungarian Nails 70%
Basket and Chair Nails 65%
Leathered Carpet Tacks 40%

Miscellaneous—

Double-Pointed, 120 count ..... 85&10%
Wire Carpet Nails ..... 50&10%
Plymouth Rock Steel Carpet Tacks..25

Extra 10 @ 10&10 %

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, B. & E. Mfg. Co.'s list.....50&10%

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....35@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel

Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.

Coopers'—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Fhaves, Cincinnati Tool Co.....20%

Lumber.

Ring Peavies, "Blue Line"...₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mail. Iron Socket Peavies...₩ doz $19.00
Cant Hooks, "Blue Line"..₩ doz $16.00
Cant Hooks, Common Finish..₩doz$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ doz $18.00

Saw.

Atkins' Perfection.....₩ doz $12.00
Atkins' Excelsior.....₩ doz $6.00
Atkins' Giant.....₩ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters—See Lifters, Transom.

Traps—

Game—

Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—

Mouse Wood,Choker, ₩ dos holes, 11@12¢
Mouse, Round Wire.....₩ doz $1.50, 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive...₩ dz $2.50 15%
Mouse, Bonanza.....₩ doz $0.90@$1.00
Mouse, Delusion.....₩ $1.00@$1.25
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 90¢; in full cases, ₩ doz.....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00

Triers—

Butter and cheese.....25%

Trimmers, Spoke.

Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—

Lothrop's Brick and Plastering. 20&10&5@35%
Reed's Brick and Plastering.....15%
Diaston's Br'k and Plastering.....25%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ⅛ ℔ Balls	26¢	34¢
No. 12, ¼ and ⅛ ℔ Balls	25¢	33¢
No. 18, ¼ and ⅛ ℔ Balls	22¢	32¢
No. 24, ¼ and ⅛ ℔ Balls	22¢	32¢
No. 36, ¼ and ⅛ ℔ Balls	20¢	31¢

No. 264, Mattrass, ¼ and ⅛ ℔ Balls.53@54¢
Chalk Line, Cotton, ⅛ ℔ Balls.....25¢
Mason Line, Linen, ⅛ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine).....15½¢
3-Ply Hemp, 1 ℔ Balls.....16¢@16½¢
3-Ply Hemp, 1½ ℔ Balls.....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔ ..15¢@16¢
2, 3, 4 and 5-Ply Jute, ⅛ ℔ Balls.....10¢
Wool.....6½¢@6¾¢
Paper.....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—

Solid Box.....50&10@50&10&5%

Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....30%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....66⅔&10%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%

Miscellaneous.

Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground.....55&5@60&5%
Unground.....65&10@65&10&5%
White Enameled-Ware—
Maslin Kettles.....60&10&5%
Boilers and Saucepans.....40%
Tinned Boilers and Saucepans.....40%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.	$2.00	$2.25
Wash-Basins, 12 in.	2.25	2.75
Keelers, 11¼ in.		4.00
Cuspidors.		3.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.	4.00	
Half-peck Measure.	3.50	

See also Pails.

Indurated Fiber—25%

Spittoons, No. 2, ₩ doz.....$9.00
Basins, Ringed, ₩ doz., No. 2, $4.80; No. 3.....$4.20
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₩ set.....$3.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₩ set.....$3 00
See also *Pails.*

Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.

Reed & Barton, Meriden Britannia Co., Simpson, Hall, Miller & Co., Rogers & Brother, Hartford Silver Plate Co.....40&5%
William Rogers Mfg. Co.....40&5&5%

Washers—

Size.....	¼	5-16	⅜	½	⅝	¾	1
Washers....	6¾	5½	4½	3½	3	3	3

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—

Iron.....₩ ℔ 3¼¢
Steel.....₩ ℔ 4 ¢

Weights, Sash—

Solid Eyes.....₩ ton $18@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.

8 in., $2.25; 10 in., $2.70; 12 in., $3.20

Wire and Wire Goods—

Iron—

Market,
Br. & Ann., Nos. 0 to 18.....72½%
Cop'd, Nos. 0 to 18.....70%
Galv., Nos. 0 to 18.....62½%
Tin'd, Tinned list Nos. 0 to 18.....62½%
Stone,
Br. and Ann'd, Nos. 16 to 18.....72½%
Bright and Ann'd, Nos. 19 to 26.....75%
Br. and Ann'd, Nos. 27 to 36.....77½%
Tinned.....
Tinned Broom Wire, 18 to 21, ₩ ℔.....5½¢
Galvanized Fence, Nos. 8 and 9.....65%
Annealed Fence, Nos. 8 and 9.....75%
Annealed Grape, Nos. 10 to 14.....75%
Brass, list Jan. 13, 1884.....25%
Copper, list Jan. 18, 1884.....25%
Barb Fence.....See Trade Report
Annealed Wire on Spools.....50%
Malin's Steel and Tin'd on Spools.....50%
Malin's Brass and Cop. on Spools.....40%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 2, 30%
Steel Music Wire, Nos. 12 to 30..55¢ ₩ ℔
Picture Wire.....New list 50%
Wire Clothes Lines, see Lines.

Bright Wire Goods—

Standard list.....85%

Wire Cloth and Netting.

Painted Screen Cloth, good quality, ₩ 100 sq. ft., $1.60 @ $1.75
Galvanized Wire Netting.....70&10@75%

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&2%
Coes' "Mechanics'".....50&10&2%
Girard Standard.....65&10%
Lamson & Sessions' Engineers'...60&10%
Lamson & Sessions' Standard....70&10%
P. S. & W. Agricultural.... } 75@75&10
Girard Agricultural..... } 75@75&10
Lamson & Sessions' Agric'l.. } 75@75&10
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&2%

Wringers, Clothes—

List March 11, 1889, 2% cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1886, 80&15@85%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw, per gal.	62 @	64
Linseed, City, boiled	65 @	67
Linseed, Western, raw	.. @	60
Lard, City, Extra Winter	53 @	54
Lard, City, Prime	50 @	51
Lard, City, Extra No. 1	45 @	46
Lard, City, No. 1	42 @	43
Lard, Western, prime	50 @	51
Cotton-seed, Crude, prime	27 @	28
Cotton-seed, Crude, off grades	22 @	25
Cotton-seed, Summer Yellow, prime	34 @	35
Cottonseed, Summer Yellow, off grades	30 @	33
Sperm, Crude	.. @	71
Sperm, Natural Spring	70 @	72
Sperm, Bleached Spring	75 @	77
Sperm, Natural Winter	76 @	78
Sperm, Bleached Winter	81 @	83
Whale, Crude	.. @	..
Whale, Natural Winter	.. @	51
Whale, Bleached Winter	.. @	53
Whale, Extra Bleached	55 @	..
Sea Elephant, Bleached Winter	60 @	62
Menhaden, Crude, Sound	20 @	22
Menhaden, Crude, Southern	.. @	..
Menhaden, Light Pressed	24 @	25
Menhaden, Bleached W'ter	31 @	32
Menhaden, Extra Bleached	35 @	..
Tallow, City, prime	.. @	45
Tallow, Western, prime	.. @	..
Cocoanut, Ceylon	.. @	7¾
Cocoanut, Cochin	.. @	8½
Cod, Domestic	31 @	32
Cod, Foreign	33 @	34
Red Elaine	31 @	34
Red Saponified.....₩ ℔	4½@	5
Bank.....per gal	24 @	..
Straits	25 @	..
Olive, Italian, bbls	70 @	72
Neatsfoot, prime	62½@	75
Palm, prime, Lagos....₩ ℔	6½@	7

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test.....per gal	8½@	9
Black, 29 gravity, 15 cold test	9 @	9½
Black, 29 gravity, summer	7 @	8
Cylinder, light, filtered	15 @	20
Cylinder, dark, filtered	14 @	20
Cylinder, dard, st'm refined	10 @	18
Paraffine, 23½ @ 24 gravity	12½@	13
Paraffine, 25 gravity	11½@	12
Paraffine, 28 gravity	10½@	11
Paraffine, red, 21 @ 22 gr'ty	.. @	14½
Paraffine, red, 23½@23 gr'ty	12½@	13

Paints and Colors.

Barytes, Prime White..... ₩ ton.	$21.00 @	$22.50
Barytes, Amer. refined	20.00 @	....
Barytes, Amer. No. 1	18.00 @	....
Barytes, Amer. No. 2	16.00 @	....
Barytes, Amer., off-color	13.00 @	15.00
Blue, Celestial	₩ ℔ 6 @	8
Blue, Chinese	50 @	55
Blue, Prussian	25 @	40
Blue, Ultramarine	10 @	30
Brown, Spanish	½@	1
Brown, Vandyke, Amer.	3 @	3½
Brown, Vandyke, English	6 @	8
Black, American Drop	8 @	10
Black, English Drop	12 @	14
Black, Frankfort, Drop	5 @	18
Black, Lamp, common	12 @	18
Black, Lamp, medium	19 @	25
Black, Lamp, prime	27 @	33
Carmine, No. 40, in bulk	3.10 @	..
Carmine, No. 40, in boxes or barrels	3.20 @	..
Carmine, No. 40, in ounce bottles	4.20 @	..
Chalk, in bulk	₩ ton. 2.50 @	..
Chalk, in bbls.	₩ 100 ℔. 30 @	35
China Clay, English	₩ ton. 13.50 @	18.00
China Clay, Southern	10.00 @	12.00
Cobalt Oxide, prep'd	2.00 @	....
Cobalt Oxide, black, lots 100 ℔	2.60 @	....
Cobalt, Oxide, black, less 100 ℔	2.65 @	....
Crocus Martus, Engl.	₩ ℔. 1½@	2¼
Crocus, American	1½@	2½
Green, Paris, in bulk	14 @	14½
Green, Paris, 170 @ 175 ℔ kegs	14½@	15
Green, Paris, small pack	16 @	21
Green, Chrome, ordinary	8 @	13
Green, Chrome, pure	22 @	25
Lead, Eng., B.B. white	9 @	10
Lead, Amn. White, dry or in oil: Kegs, lots less than 1000 ℔..	@	7¾
Kegs, lots 1000 ℔ to 5 tons.	@	7¼
Kegs, lots 5 tons to 12 tons..	@	7¼
Kegs, lots 12 tons and over..	@	7
Lead, White, in oil, 25 ℔ tin pails, add to keg price.	@	½
Lead, White, in oil, 12½ ℔ tin pails, add to keg price	@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.	@	2½
Lead, Red, bbls. and ½ bbls	6¾ @	7½
Lead, Red, kegs	7 @	7¾
Litharge, kegs	7 @	7¾
Litharge, bbls. and ½ bbls	6¾ @	7½

TERMS, &c.—Lead and Litharge.—On lots of 1000 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle	1.35 @	1½
Ocher, French Washed	1½@	2½
Ocher, German Washed	1½@	3
Ocher, American	½@	1¼
Orange Mineral, English	9 @	9½
Orange Mineral, French	9½@	10
Orange Mineral, German	8½@	9½
Orange Mineral, American	8 @	8½
Paris White, English Cliffstone	90 @	1.10
Paris White, American	70 @	80
Red, Indian, English	5½@	7
Red, Indian, American	2 @	6
Red, Turkey	9 @	14
Red, Tuscan	9 @	11
Red, Venetian, American ₩ 100 ℔.	1.00 @	1.35
Red, Venetian, English	1.25 @	1.75
Sienna, Italian, Burnt and Powd. ₩ ℔	5 @	6½
Sienna, Ital., Burnt Lumps	1½@	3½
Sienna, Ital., Raw, Powd	5 @	6½
Sienna, Ital., Raw Lumps	2 @	3½
Sienna, American, Raw	1½@	1¾
Sienna, American, Burnt and Powdered	1½@	1¾
Talc, French	1½@	1¾
Talc, American	1 @	1¼
Terra Alba, Fr'ch. ₩ 100 ℔	72½@	80
Terra Alba, English	80 @	85
Terra Alba, American No. 1	70 @	75
Terra Alba, American No. 2	38 @	40
Umber, Turkey, Bnt. and Powd. ₩ ℔	3½@	4
Umber, Turkey Bnt. Ln	2½@	3
Umber, Turkey, Raw and Powdered	3½@	..
Umber, Turkey, R'w Lmps	2½@	2¾
Umber, Turkey, Bnt. Amer.	1½@	1¾
Umber, Turkey, R'w Amer.	1½@	1¾
Yellow, Chrome	10 @	25
Vermilion, Americ. Lead	11½@	13
Vermilion, Quicks'er, bulk	.. @	77½
Vermilion, Quicks'er, bags	.. @	78½
Vermilion, Quicksilver, smaller pkgs	.. @	82½
Vermilion, English Import	85 @	87½
Vermilion, Imitation, Eng.	8 @	25
Vermilion, Trieste	87½@	90
Vermilion, Chinese	90 @	95
Whiting, Common. ₩ 100 ℔	40 @	45
Whiting, Gilders'	50 @	55
Zinc, American, dry	4½@	5¼
Zinc, French, Red Seal	.. @	8½
Zinc, French, Green Seal	.. @	8¾
Zinc, French, V. M. X	.. @	7
Zinc, Antwerp, Red Seal	.. @	7¼
Zinc, Antwerp, Green Seal	.. @	8¼
Zinc, German, L. Z. O	.. @	6¾
Zinc, V M. in Poppy Oil, G. Seal, lots of 1 ton and over	10½@	11¼
lots less than 1 ton	11 @	11½
Zinc, V. M. in Poppy Oil, Red Seal	.. @	..
lots of 1 ton and over	10 @	10¼
Lots of less than 1 ton	10½@	10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese.....₩ ℔	35 @	40
Blue, Prussian	20 @	45
Blue, Ultramarine	12 @	18
Brown, Vandyke	7 @	12
Green, Chrome	8 @	13
Green, Paris	16 @	18½
Sienna, Raw	7 @	13
Sienna, Burnt	7 @	13
Umber Raw	7 @	10
Umber, Burnt	7 @	10

Glue.

Low Grade.....₩ ℔	8 @	10
Cabinet	12 @	14
Medium White	13 @	15
Extra White	17 @	20
French	10 @	2
English	10 @	15
Irish	12 @	15

CURRENT METAL PRICES.

OCTOBER 29, 1890.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron: ⅜ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.	₩ ℔ 2.00 @ 2.10¢
Refined Iron: ⅜ to 2 in. round and square.. 1 to 4 in. x ⅜ to 1½ in. 4¼ to 6 in. x ⅜ to 1 in.	₩ ℔ 2.10 @ 2.30¢
1 to 6 in. x ¼ and 5-16	₩ ℔ 2.30 @ 2.50¢
Rods—⅝ and 11-16 round and sq.	₩ ℔ 2.20 @ 2.40¢
Bands—1 to 6 x 3-16 to No. 12	₩ ℔ 2.40 @ 2.60¢
"Burden Best" Iron, base price	₩ ℔ 3.00¢
Burden's "H. B. & S." Iron, base price	₩ ℔ 2.80¢
"Ulster"	₩ ℔ 3.00¢
Norway Bars	4.00¢
Norway Shapes	5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16	₩ ℔ 3.00	@ 3.00¢	3.50	@ ¢
17 to 20	₩ ℔ 3.25	@ 3.25¢	3.50	@ 3.75 ¢
21 to 24	₩ ℔ 3.35	@ 3.35¢	3.75	@ ¢
25 and 26	₩ ℔ 3.45	@	3.75	@ ¢
27	₩ ℔ 3.55	@ 3.62½¢	4.00	@ ¢
28	₩ ℔ 3.75	@ ¢	4.25	@ ¢
	B. B.		2d qual.	
Galv'd, 14 to 20,	₩ ℔, 5.00	@	4.75½	@ ¢
Galv'd, 21 to 24,	₩ ℔, 5.37½	@	5.12½	@ ¢
Galv'd, 25 to 26,	₩ ℔, 5.75	@	5.50	@ ¢
Galv'd, 27	₩ ℔, 6.12½	@	5.85½	@ ¢
Galv'd, 28	₩ ℔, 6.50	@	6.23	@ ¢
Patent Planished	₩ ℔ A 10¢		B, 9¢	
Russia	₩ ℔ 9¼¢	@ 10¢		
American Cold Rolled B. B.	₩ ℔ 5¢	@ 7¢		
Craig Polished Sheet Steel	₩ ℔, 8½¢			

English Steel from Store.

Best Cast	₩ ℔ 15 ¢
Extra Cast	₩ ℔ 16½ @ 17 ¢
Swaged, Cast	₩ ℔ 16 ¢
Best Double Shear	₩ ℔ 15 ¢
Blister, 1st quality	₩ ℔ 12 ¢
German Steel, Best	₩ ℔ 10 ¢
2d quality	₩ ℔ 9 ¢
3d quality	₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality	₩ ℔ 15 ¢
2d quality	₩ ℔ 14 ¢
3d quality	₩ ℔ 12½¢
R. Mushet's "Special"	₩ ℔ 48 ¢
" " "Titanic"	₩ ℔ 20 ¢

METALS.

Tin.

	Per ℔
Banca, Pigs	24 ¢
Straits, Pigs	23¾¢
Straits in Bars	26½¢

Tin Plates.

Charcoal Plates.—Bright.			Per box.
Melyn Grade	IC, 10 x 14	@	$6.50
" "	IC, 12 x 12	@	6.75
" "	IC, 14 x 20	@	6.50
" "	IC, 20 x 28	@	13.25
" "	IX, 10 x 14	@	8.00
" "	IX, 12 x 12	@	8.25
" "	IX, 14 x 20	@	8.00
" "	IX, 20 x 28	@	16.00
" "	DC, 12½ x 17	@	6 00
" "	DX, 12½ x 17	@	7.20
Calland Grade	IC, 10 x 14	@	6.50
" "	IC, 12 x 12	@	6.75
" "	IC, 14 x 20	@	6.40
" "	IX, 10 x 14	@	7.65
" "	IX, 12 x 12	@	7.90
" "	IX 14 x 20	@	7.65
Allaway Grade	IC, 10 x 14	@	6.00
" "	IC, 12 x 12	@	6.15
" "	IC, 14 x 20	@	6.00
" "	IC, 20 x 28	@	11.80
" "	IX, 10 x 14	@	7.17
" "	IX, 12 x 12	@	7.30
" "	IX, 14 x 20	@	7.15
" "	IX, 20 x 28	@	14.25
" "	DC, 12½ x 17	@	5.65
" "	DX, 12½ x 17 6.00	@	6.65
Coke Plates.—Bright.			
Steel Coke.	IC, 10 x 14, 14 x 20	@	$5.60
	10 x 20	@	7.75
	20 x 28	@	11.25
	IX, 10 x 14, 14 x 20	@	6.50
BV Grade.	IC, 10 x 14, 14 x 20	@	5.60
Charcoal Plates.—Terne.			
Dean Grade.	IC, 14 x 20	@	$5.40
	20 x 28	@	10.70
	IX, 14 x 20	@	6.10
	20 x 28	@	12.10
Abecarne Grade.	IC, 14 x 20	@	5.10
	20 x 28	@	10.35
	IX, 14 x 20	@	6.10
	20 x 28	@	12.10

Tin Boiler Plates.

IXX, 14 x 26	112 sheets	@ $13.50
IXX, 14 x 28	112 sheets	@ 13 75
IXX, 14 x 31	112 sheets	@ 15 25

Copper.

DUTY: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ ℔. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot.

Lake	@ 17¼¢
Baltimore Grade	@ 15¼¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, June 27, 1890, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		25	25	25	26	27	28	31	33
30		72	25	25	25	26	28	30	34	....
36	96		25	25	25	27	29	33	36	....
36		96	25	25	26	28	30	34	38	....
48	96		25	25	27	29	31	35	....	....
48		96	25	25	28	30	32	36	....	....
60	96		25	25	30	32	37	....	....	....
60		96	25	26	31	....	....	....	....	....
84	96		26	27	....	....	....	....	....	....
84		96	27	28	....	....	....	....	....	....
Over 84 in. wide			28	30	....	....	....	....	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz.
Per pound	$0.27	0.29	0 31	0.35

Bolt Copper, ⅝ inch diameter and over, per pound 25¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	29¢
12 ounce and up to 14 ounce to square foot	30¢
10 ounce and up to 12 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ ℔
12 oz. and lighter.....33¢. By the case...32¢ ₩ ℔

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ ℔

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1⅛
8-14	6-12	39	35	32	31	30	29	26
15	13	40	35	33	32	31	30	27
16	14	41	36	34	33	32	31	27
17	15	42	37	35	32	33	32	28
18	16	44	38	36	34	33	32	29
19	17	45	39	37	36	35	34	31
20	18-19	46	41	39	38	37	36	33
21	20	48	43	41	40	39	38	36
22	21	50	44	42	41	40	39	38
23	22	52	46	44	43	42	41	41
24	23	55	48	46	45	43	42	43
25	24	58	51	48	47	46	45	47

Copper Bronze and Gilding Tube, 4¢ ₩ ℔ additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	45¢ ₩ ℔
Bronze Tubing, 8¢ ₩ ℔ more than Brass.	
Discount from list	25 @ ... %

Roll and Sheet Brass.

Discount from list 20 %

High Brass Rods.

Over 1 inch diameter	29¢
½ inch to 1 inch diameter, both inclusive	28¢
No. 8 and less than ½ inch diameter	28¢
Smaller than No. 8	33¢

Hexagon, Octagon and Square, 2¢ ₩ ℔ advance over Round Rods.

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 ℔.

Western Spelter	6¼ @ 6¾¢
"Bertha"	8¢

Zinc.

Duty; Sheet, 2½¢ ₩ ℔.

600 ℔ casks	7 @ 7¼¢
Per ℔	7¾¢

Lead.

Duty: Pig, $2 ₩ 100 ℔. Old Lead, 2¢ ₩ ℔. Pipe and Sheets, 3¢ ₩ ℔.

American	6¢ @ 6¼¢
Bar	6¾¢
Pipe, subject to trade discount	8¢
Tin-Lined Pipe, subject to trade discount	45¢
Block Tin Pipes, subject to trade discount	45¢
Sheet, subject to trade discount	8¾¢

Solder.

½ @ ½ (Guaranteed)	16½¢
No. 1	13
Extra Wiping	11½¢ @ 13

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ ℔ 22 ¢
Hallett's	" 21 ¢

ALUMINUM.

Prices in Ingots.

$2.00 ₩ ℔ in lots of 1000 ℔ and over.
$2.25 ₩ ℔ in lots of 500 ℔ and over.
$2.50 ₩ ℔ in lots of 100 ℔ and over.

Prices Per Pound on Rolled Sheets.

(Brown & Sharpe, Standard Gauge.)

Wider than. And including.	8 in. 10 in.	10 in. 14 in.	14 in. 18 in.	18 in. 22 in.	22 in. 24 in.
Up to No. 20 inclusive	$2.50	$2.60	$2.80	$3.00	$3.20
Nos. 21, 22, 23 and 24	2.60	2.70	2.90	3 10	3.30
Nos. 25 and 26	2.70	2.80	3.00	3.20	3.40
Nos. 27 and 28	2.80	2.90	3.10	3.30	3.50

Sheets, thinner than No. 28 gauge and wider than 24 inches, special prices not less than $5 per pound.
Add 35 cents per pound for sheets cut to particular widths and lengths.
Sheets rolled to .001 in. and under, 50 cents per ounce.
Leaf in books, 20 cents per book; $2 per pack of 10 books, sheets 5 x 5 inches.

Aluminum Tubing.

From $4 per pound upward, according to size and thickness of walls.

Aluminum Castings.

From 50 cents upwards per pound extra over the cost of the metal in ingots, according to the number wanted, weight, the difficulty of casting, cost of patterns, &c.

Aluminum Wire in Coils.

(Brown & Sharpe, Standard Gauge.)

	Per ℔
All numbers up to No. 14 (.064 in.) inclusive	$3.00
Nos. 15 (.05706 in.) to 22 (.02534 in.) inclusive	3.25
Nos. 23 (.02571 in.) and 24 (.0201 in.) inclusive	3.50
Nos. 25 (.0179 in.) and 26 (.01594 in.) inclusive	3.75
Nos. 27 (.014195 in.) and 28 (.012641 in.) inclusive	4.00
Nos. 29 (.011257 in.) and 30 (.010023 in.) inclusive	4.25
No. 31 (.008928 in.)	4.50
No. 32 (.00795 in.)	4.75
No. 33 (.00708 in.)	5.00
No. 34 (.00630 in.)	5.25
No. 35 (.00561 in.)	5.75
No. 36 (.00500 in.)	6.25
No. 37 (.00445 in.)	7.00
No. 38 (.003965 in.)	8.50
No. 39 (.003531 in.)	12.00
No. 40 (.003144 in.)	16.00

Spooling, on 1-pound spools, 15 cents per pound extra
Spooling, on 16-pound spools, 5 cents per pound extra

Old Metals.

(Prices Paid in New York.)

Heavy Copper	₩ ℔ 12 ¢
Light Copper	₩ ℔ 11 ¢
Heavy Brass	₩ ℔ 10 ¢
Light Brass	₩ ℔ 8 ¢
Lead	₩ ℔ 4 ¢
Tea Lead	₩ ℔ 3½¢
Zinc	₩ ℔ 3 ¢
No. 1 Pewter	₩ ℔ 16 ¢
No. 2 Pewter	₩ ℔ 8 ¢
Wrought Scrap Iron	₩ gross ton $19.00
Heavy Cast Scrap	₩ gross ton 12.00
Stove Plate Scrap	₩ gross ton 8.00
Burnt Iron	₩ gross ton 6.00